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THE BRICKBVILDER

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THE BRICKBUILDER.

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ADVERTISING.

Advertisers are classified and arranged in the following order:—

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Advertisements will be printed on cover pages only.

NOTICE.

A copy of THE BRICKBUILDER Prospectus for 1902 will be mailed to each subscriber on January 1.

NEW YORK CITY is undoubtedly entering upon a new era as a result of the recent overturn in the elections. Without undertaking to discuss the character or limitations of past officials, the city is certainly the great gainer by the appointments which have just been made in the departments having to do with building operations. Mr. Perez M. Stewart has been appointed superintendent of buildings of the borough of Manhattan, and Mr. William Martin Aiken has likewise been appointed consulting architect. These gentlemen are thoroughly well known both for their personal integrity and for their ability in their respective spheres. Mr. Aiken made a good record for himself while architect of the Treasury in Washington. He is thoroughly competent, a good designer and an honest man, conditions which unfortunately are more conspicuous by their absence than otherwise in the office-holders of our large cities. Mr. Stewart is a builder who has had over fifteen years' experience, and, unless his reputation of the past belies him, there will be no foundation in the future for the disagreeable rumors which have so persistently been made heretofore regarding peculations in the Department of Buildings. Both of these gentlemen will have large responsibilities and great discretionary powers, and we feel that New York is certainly to be congratulated upon its ability to put such men in office. In fact it seems as if the political atmosphere all over the country is becoming clarified, and with the high standard which marks our President at Washington and the mayor elect in New York, we ought to expect a practical refutation of the criticism that we so often hear expressed of the American political system — that it fails to bring into office the best available elements.

THE capitalization of the United States Steel trust is approximately fourteen hundred million dollars. If we were to capitalize the fire losses of the United States at even so high a rate as eight per cent, it would amount to nearly two billion dollars. The United States Steel corporation is a money earner, which has the effect of bettering social, structural and business conditions. The fire loss is a money waster which represents a perpetual drain on the community without the slightest redeeming feature. And the worst part of it is that the greater portion of this tremendous annual expenditure is needless. By this time the country has had enough object lessons to show beyond question that buildings can be constructed which will not burn down; and if, instead of continuing to pay money for premiums, it were only possible to spend one half the amount in eliminating the danger spots of our large cities by substituting fire-proof for inflammable construction in the cheaper and more crowded thoroughfares, the annual fire loss would in a very few years be reduced more nearly to the relative proportions of the fire loss in such cities as Paris or Berlin. These cities are far from being fire-proof throughout, but they are spared the constant menace of inflammable structures surrounding and hedging in the costly commercial buildings, a condition which exists in every large city in this country.

IT is reported in one of the British journals that an office building on American lines is to be erected in London on the north side of the Strand near its junction with the new thoroughfare from Holborn. The building is to have an area of 125,000 square feet, or four times that of the largest office building in this country, and will have six thousand rooms aggregating 900,000 square feet of rentable area. Part of it will be seven stories and part ten stories high, not very high judged by American standards, but enough for starting such a structural innovation. After all, we cannot expect to hold a monopoly of tall building construction.

Colonial Brickwork of New England. I.

SALEM, MASS.

BY WALTER H. KILHAM.

ONE hundred years ago the commerce of New England was distributed among a score of ancient towns situated at intervals along its irregular and deeply indented coast. Northward from Boston within sixty miles were situated the then busy harbors of Marblehead,

STONE HOUSE, CHESTNUT STREET.

Salem, Beverly, Gloucester, Newburyport and Portsmouth, while southward were New Bedford and a dozen Cape Cod towns of less importance. All of these places have many points of similarity. Placed at the heads of rocky bays or broad tidal rivers, their enterprising captains and shipowners lined their wide, elm-shaded streets with those rows of stately brick mansions which with their quiet old-school refinement have ever excited the admiration of later generations, and in our day, serv-

TYPICAL SALEM HOUSE, SHOWING STABLE AND ENTRANCE.

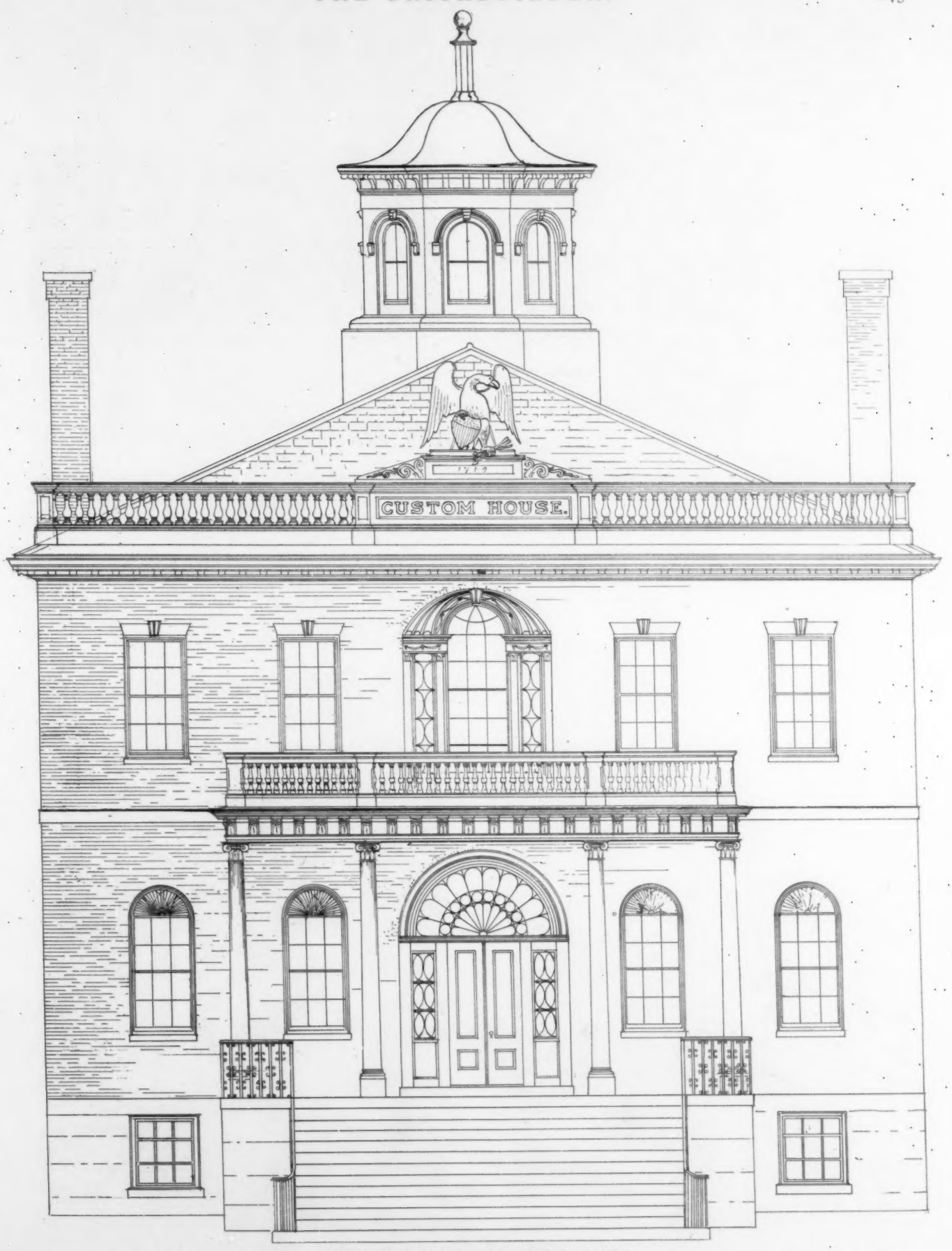
ing as the models of our revived "colonial" architecture, continue to rebuke the ostentation and trivial display of the decadent academic taste. How it happened that in a newly discovered country, without any of the institutions which tend to refine the taste or train the æsthetic sense, and without a single great work of architecture, these untaught master builders, laboriously, we may suppose, studying their details from the few architectural books which were at that time available, were able to produce these carefully studied and delicately profiled moldings and capitals, which the modern draughtsman,

REAR OF STONE HOUSE, CHESTNUT STREET.

surrounded by his piles of plates and photographs, vainly tries to imitate, is one of the mysteries which surround the early life of our republic. We may infer that these early builders depended upon a taste which, guided only by the few good books at their disposal, and free from the injurious influence of any bad or vulgar work, and

CUSTOM HOUSE.

unhampered by distracting notions of sanitation or convenience, led their hands and minds in a straight and narrow but correct and chaste line of thought which, interpreting itself in brick and wood, produced the formal elegance and well-balanced reserve which characterize the buildings of this period. Their materials were few in number. Bricks they had and timber in plenty. Stone was little used. Carefully squared, rather small granite blocks served for the underpinning. Occasionally white marble was sparingly used for lintels and sills. The noble forests of the back country supplied them with magnificent wide boards for dadoes and panels.



FRONT ELEVATION, SALEM CUSTOM HOUSE.
Measured and Drawn by W. R. Greeley and I. R. Adams.

DOORWAY, NO. 10 CHESTNUT STREET.

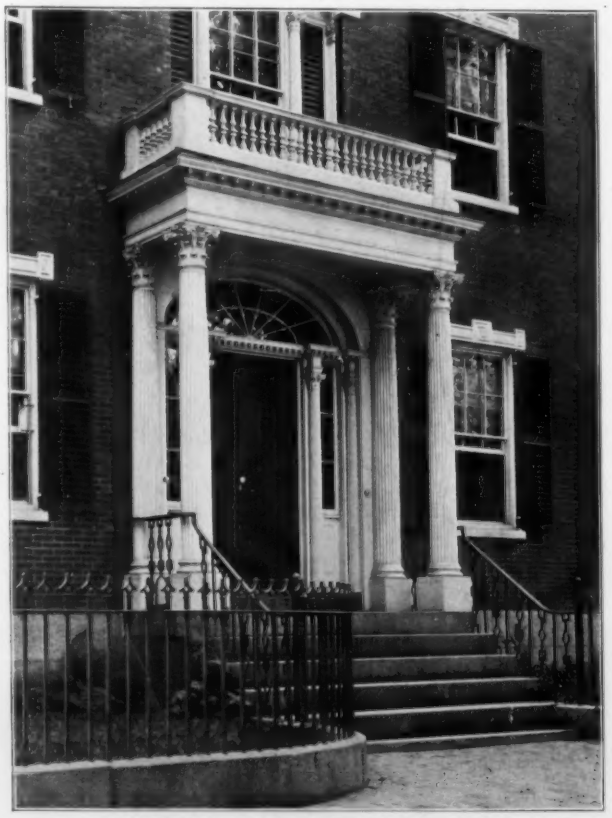
Owing to the comparative isolation of the towns of that period, marked differences in style, which are frequently characteristic of their inhabitants, are seen in the different places. For example, Salem work varies strongly from Boston, Marblehead work from both, while Portsmouth seems to have gone on an entirely different idea from either. These articles will present typical studies of the architecture of all these cities.

It must be remembered that the details of the brick buildings were generally expressed in wood. Beyond a simple molded brick water table or belt course, and sometimes a lower member of a cornice, very little ornamental brickwork is seen. The bricks are rather small in size and universally laid in Flemish bond.

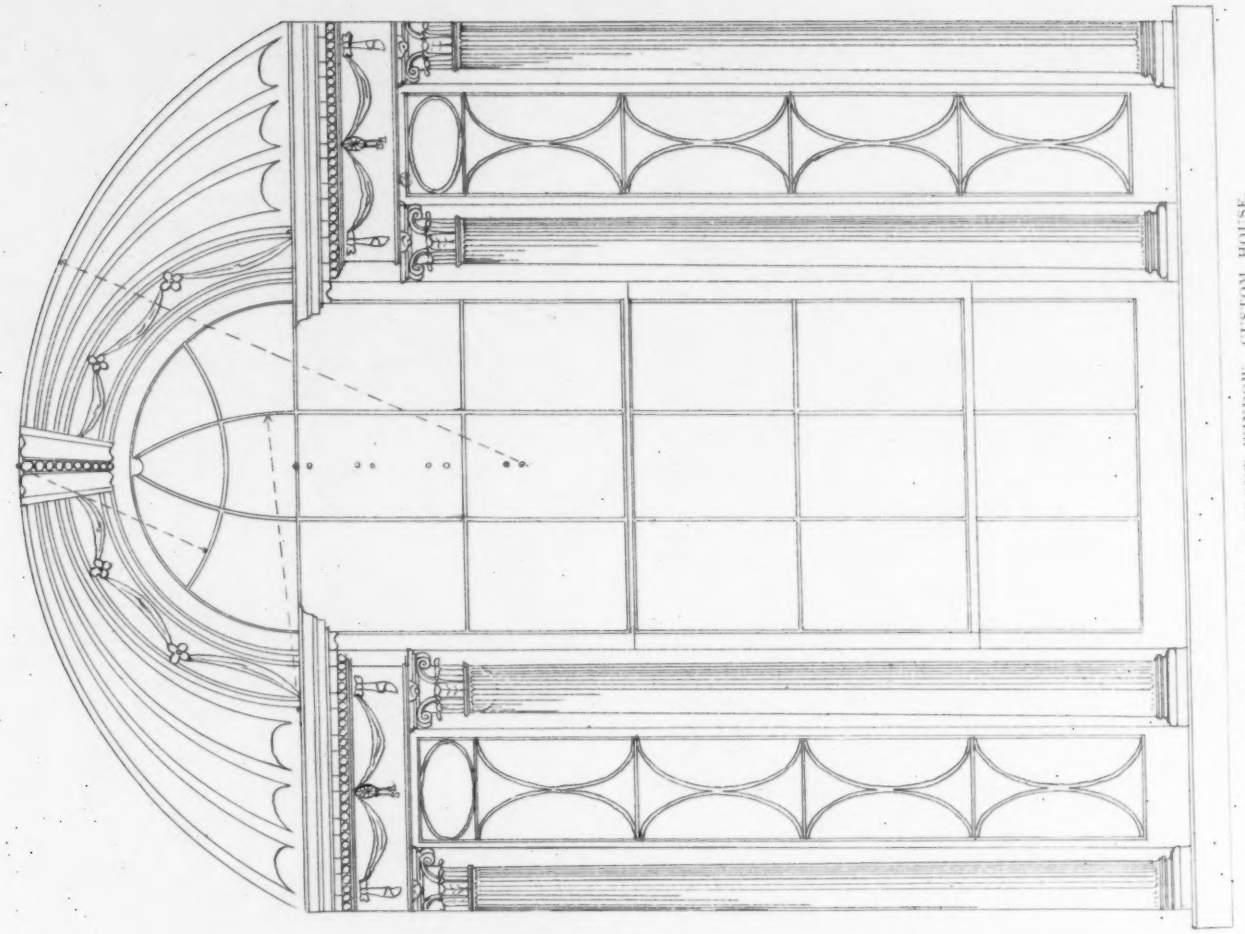
SHREVE HOUSE, CHESTNUT STREET.

HOUSE ON CHESTNUT STREET.

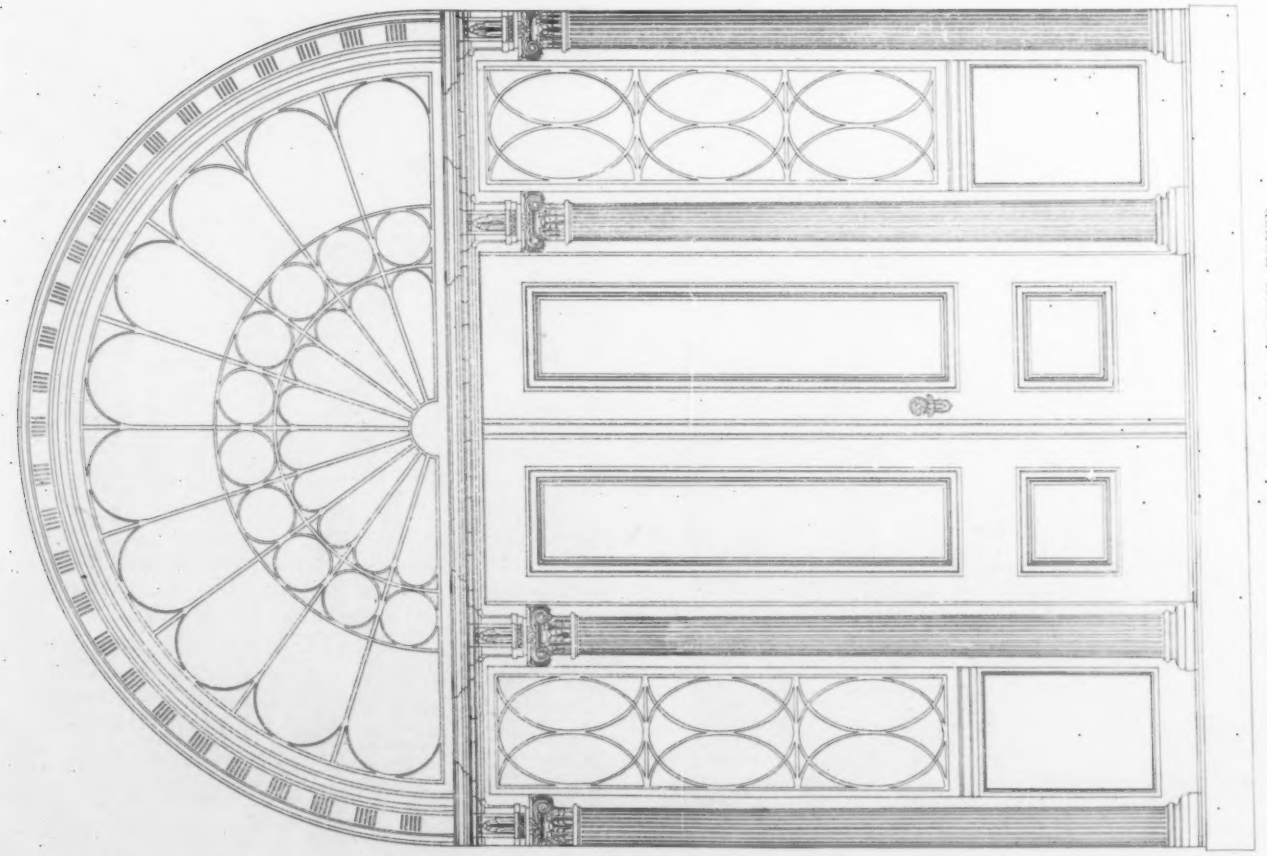
Chief in interest among the decaying seaports of the eastern coast is the old city of Salem. Her broad and stately streets, where the sea wind, fresh from the harbor islands, blows cool through the great elms, are lined with the finest examples of colonial architecture to be found in this country. The typical Salem house is a square, three-storied, hip-roofed building, with the third story somewhat lower than the others, often only seven or eight feet in height. The house stands but a few feet back from the street and is entered through an elaborately ornamented portico or stoop, which, with sometimes the window above it, forms the principal architectural motif of the composition. These Salem porticoes are almost every one of remarkably correct and graceful design. Many of



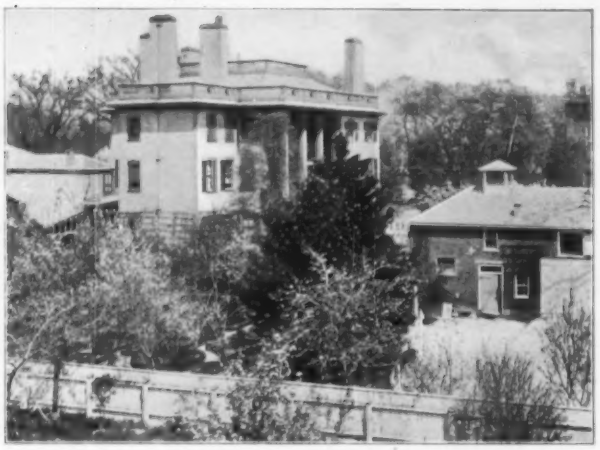
DOORWAY, NO. 29 CHESTNUT STREET.



DETAIL OF CENTRAL FRONT WINDOW, CUSTOM HOUSE.



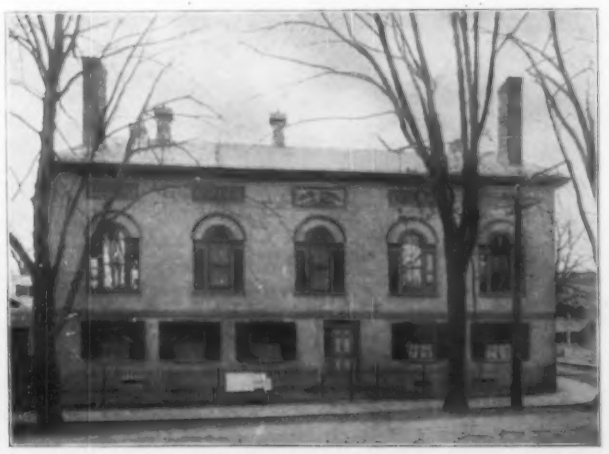
DETAIL OF MAIN ENTRANCE, CUSTOM HOUSE.



REAR OF ANDREW HOUSE, SHOWING GARDEN AND STABLING.

these house and porches are the work of one Samuel Macintyre; who lived in Salem from 1757 to 1811. His father and brother were "housewrights" in Salem, and a nephew, Joseph, continued in Salem as a carver until his death in 1852. Samuel Macintyre appears to have been a universal genius, for in addition to his skill in architecture he was a skilful musician and organist. As an architect he seems to have been easily a rival of Bulfinch, though his opportunities for doing important work were limited. To him we are indebted for the beautiful spire of the South Church and for old Hamilton Hall opposite, whose walls, with those of the old Assembly House, also his work, have seen the blooming of generations of the youth and beauty of the old town. The Nichols house, on Federal Street, is likewise by Macintyre, and several other houses, as well as many of the ornate fence posts, urns, eagles and other ornaments about the city. He designed the Park Street Church spire in Boston, and many of the tall merchantmen of Salem bore for their figurehead an example of his skill.

The Salem of to-day is fast changing from the picturesque seaport of the early decades of the last century, when the harbor docks were alive with the bustle of fitting out and receiving Indiamen and privateers. Dingy coal barges replace the graceful square-riggers, and the trade in dry goods and prosaic household furnishings has replaced the romantic voyages to far-off Cathay which fired the juvenile mind in the old days and sent the Salem house flags to every port in the East. But Chestnut Street, upper Essex Street and Washington Square are left almost unchanged, with their noble mansions intact and growing more beautiful under the mellowing hand of time.



HAMILTON HALL.

Half way along Derby Street, at the head of what was once a bustling pier, stands the Custom House, a dignified brick building dating from 1818. From a literary point of view the genius of Nathaniel Hawthorne, who was once collector of the port, has given the Salem Custom House wide celebrity by the description of it in the opening chapter of "The Scarlet Letter." Architecturally, however, the building is an exceedingly meritorious piece of work, looking its purpose exactly and with much good colonial detail, as the drawings which we publish elsewhere in this issue will indicate. It is interesting to note that in its construction slates were imported from Wales and flagstones for the sidewalks from Potsdam, N. Y., by way of the St. Lawrence. There are pine boards 26 inches wide in the dado. This building cost about $36,000.

HOUSE ON CHESTNUT STREET.

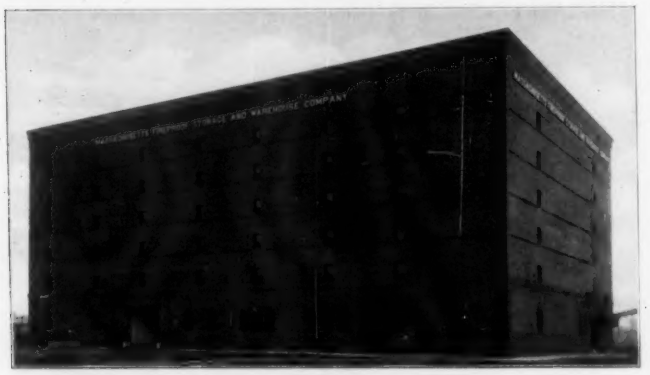
We have used the word "colonial" in its generic sense. It will of course be understood that much of the work known under that name was executed after the Revolution; in fact, nearly all of the most important work was erected in the prosperous years from 1790 to 1812, and again after the second war with England, when many of the seaport towns were enriched with the ill-gotten gains of privateersmen, and before the commercial activity of the old port had subsided.

Anything written about the old houses of Salem would not be complete without a word about the gardens. Behind the great houses, carefully screened from the street and from the neighboring premises by high lattices and board fences, are the gardens, with their high box hedges, walks of yellow gravel, trellises overgrown with clematis and roses, and geometrical flower beds bursting with the glory of the old-fashioned annuals and perennials, hollyhocks and asters, gay against the whitewashed fences and green foliage. Here more than anywhere else lingers the genius of the old seaport, and here may it linger for years to come, undisturbed by crowding business or modern innovation.

The Design and Construction of the Modern Warehouse.

BY AUGUSTUS N. RANTOUL.

THE external structure of a warehouse should be of the most substantial character. It should express immense strength and the greatest security. Thickness of walls, the absence, so far as possible, of openings of any nature, simplicity of design, and a quiet color, assist much in attaining the required effect. Aside from the



MASSACHUSETTS STORAGE WAREHOUSE, BOSTON.
Andrews, Jaques & Rantoul, Architects.

real value of these features, the outside appearance of these buildings has much of a sentimental value in the eyes of the public, and the warehouse should be its own best advertisement.

In some cases trust companies and safe deposit vaults have been combined with the storage of goods, but this seems to be possible only where the conditions

VAN ENTRANCE, MASSACHUSETTS STORAGE WAREHOUSE.

are rather unusual. Trust companies and safe deposit vaults, in order to be successful, should be in a thickly populated district, and the value of land in a location of this kind is generally such as to prohibit its use for storage purposes. Sometimes, however, this high value of land is overcome by increased height in the building, that is, by obtaining a larger floor area for storage space to a given area of land covered, thus enabling the building, though costly, to yield a proper return on the total investment. The most influential factor in determining the height of these warehouses is generally the value of the land on which they stand. They are required to carry the very heaviest loads, and accordingly the thickness of the walls and the amount of steel used, and also the cost, increase rapidly with the number of stories. The height of the building should stand in direct relation to the value of the land it occupies. It cannot be good policy to build a high and therefore an expensive building on comparatively inexpensive land, for the cost of handling increases with the height to which the goods must be raised.

For protection against fire from the outside, the external walls should be carrying walls. They should be of sufficient thickness to carry the loads without the assistance of steel columns. The steel framing should be confined to the interior supports and floors. Where this composite form of construction is used, the reasonable limit of height is soon reached, for the walls of such a heavily loaded building over nine or ten stories high

MAIN ENTRANCE, MASSACHUSETTS STORAGE WAREHOUSE.

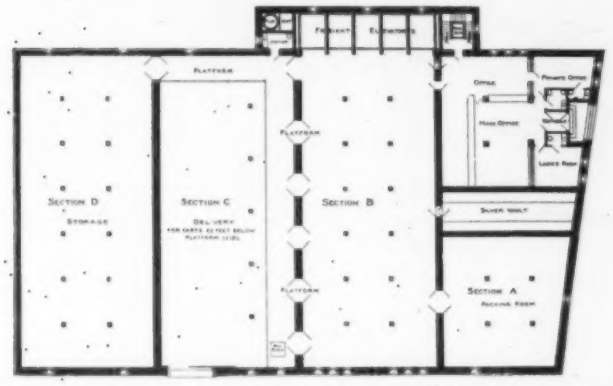
would be so thick as to be extravagant in the amount of material involved and in the area of rentable storage space lost.

In planning, the most careful study must be given to the methods of administration now generally adopted in these modern warehouses. The error frequently made, and which must be carefully guarded against, is an effort to obtain an unreasonable amount of rentable storage space at the expense of economical operation. Liberal space, well lighted, well ventilated and high studded, should be given to the steam plant, in itself one of the most essential features of the building. This involves the heating, the elevator, the electric and the cold-storage service, and frequently the pumping service for the fire standpipes and artesian wells.

Ample space must be given to the receiving and delivery platform. This should be centrally situated between the van entrance and the battery of elevators, and adjacent to the office. If this platform is too contracted it will increase the chance of damage to the goods and the cost of handling them. On the other hand, if this platform is of too liberal dimensions, the tendency is to delay the prompt and proper distribution

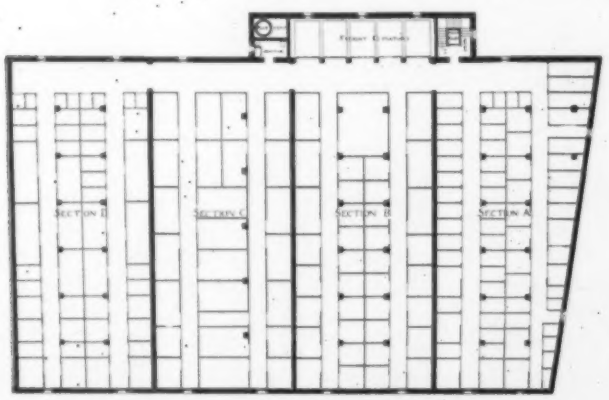
of the goods and thus create confusion. It is generally considered an advantage to have this space, where the principal part of the work is done, under the immediate supervision of the office, and the platform should be located accordingly.

Two thirds or at least one half of the building should be divided into compartments of various sizes. A unit of



FIRST FLOOR PLAN, MASSACHUSETTS STORAGE WAREHOUSE.

size should be established, and all compartments should be the unit or a multiple of it. Opinion varies as to the proper capacity for this unit, but the best results seem to have been obtained by adopting a unit which shall equal as near as possible the capacity of the van. These vans naturally vary somewhat in size, but a unit of 5 feet by 8 feet on the floor by 10 feet high, giving 400 cubic feet, has been found to successfully answer the purpose in several of these modern warehouses, although the height of 10 feet appears to be somewhat excessive. The least valuable storage space is the space farthest from the floor, and my belief is that 9 feet in height is sufficient, and that a building containing ten stories 9 feet high will earn a larger return on the investment than one containing nine stories 10 feet high, notwithstanding the fact



TYPICAL FLOOR PLAN, MASSACHUSETTS STORAGE WAREHOUSE.

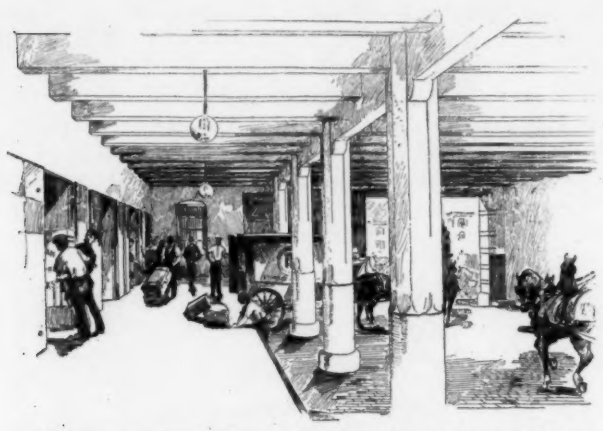
that the ten-story building will cost materially more than one of nine stories. Though the walls and columns are no longer, the additional story, with its added load, increases the cost of the building, not only by the cost of the floor and finish, but by the proportionate increase of material required for strength in the columns, walls and foundations. This limit of 9 feet applies, however, only to the intermediate stories. The basement should have good height in order to accommodate the boiler and engine rooms, and the first floor should have a stud higher than 9 feet in order to accommodate the vans. Experience has shown that it is best to have the vans drive directly into the building. The safety to the goods against robbery and against damage by the elements, as well as the privacy of this method, appeals strongly to the public, and though considerable space must be given up to the maneuvering of the vans the sacrifice seems to be justified. This method of delivering the goods from the van, if adopted, establishes absolutely the level of the first

CORRIDOR OF PRIVATE VAULTS, MASSACHUSETTS STORAGE WAREHOUSE.

floor, which must be thirty inches above the grade of the van entrance, that being the height of the floor of the van above the ground, and this accordingly precludes the possibility of good windows in the basement. On account of this some form of artificial ventilation becomes necessary in the boiler and engine rooms. The greatest care must be taken also in the ventilation of the van space, inasmuch as the introduction of horses into the building will create odors which, unless checked, are bound eventually to permeate the whole warehouse. Such a condition invariably occasions the severest criticism from the tenants. Automobiles, already being so successfully used by some warehouses, are likely to prove the remedy for this evil. The upper stories should also be higher than the intermediate floors, for the careful manager will store, as far as possible, in the top of the building, such articles as have the greatest bulk and least weight, like carriages, sleighs, etc.

Another reason for making the upper floor higher studded is because it must contain the picture gallery,

where wall space is the chief requirement. The picture gallery must be lighted with skylights, thus meeting the demands of artists for the storage of valuable pictures. These must be stored in the securest buildings, and so hung as to have the proper top light to exhibit them to possible purchasers. This section, and one or two others in the building for the storage of pianos, valuable furniture, etc., should be made as dust-proof as possible, and kept at a higher temperature than the rest of the building.



DRIVEWAY AND DELIVERY PLATFORM, MASSACHUSETTS STORAGE WAREHOUSE.

A silver vault for the storage of silver-trunks has been found an advantage in most cases. It is generally built in the basement, the safest place in case the building above should collapse. It is built with heavy walls of brick, lined with steel, and fitted inside with iron racks for trunks. It should have but one entrance with double vault doors. The increased security of such a compartment permits of an extra charge on the storage of very valuable trunks.

The intermediate stories should have the simplest and most symmetrical plan, with one liberal distributing aisle developing on the battery of elevators, with cross aisles serving the numerous compartments and the open storage space. These cross aisles should be about 6 feet wide, in order to accommodate the trucking and also to provide for the swing of the compartment doors, which are at least four feet wide.

Cold storage, which has proved to be such a great source of revenue, demands special attention. Opinion varies as to the best location for the cold-storage compartment, but in many ways it seems advantageous to have it in the basement. In the first place the basement, on account of its tendency to dampness, is bound to be the least valuable storage space, and dampness ceases to be a serious consideration where the temperature is constantly kept below 30 degrees. Again, the temperature of the basement is less susceptible to the outside influences of the atmosphere, and accordingly less insulation is required. By placing the cold section in the basement, it can be arranged to come in close connection with the cold-storage plant, a decided advantage in the transmission of air at a low temperature. The best system, no doubt, is an indirect system with a fan. By this system the air is chilled in a cold chamber and blown through ducts into the cold-storage compartments. This method prevents the goods from coming in contact with the great amount of ammonia piping required, and reduces the chance of damage to the goods from leaking joints and from the dampness occasioned by the periodical melting of the frost on the pipes.

In planning, too much deference cannot be shown to the requirements of the underwriters. Sometimes the buildings themselves are insured, and frequently tenants insure the goods they store, and, above all, the quotation of a low rate of insurance is one of the strongest arguments in favor of the building. Frequent fire-walls of solid masonry, running from the foundations up through the roof, containing as few openings as the plan will permit, are a great advantage. The elevator shaft should be, as far as possible, surrounded with masonry walls without openings, and the front should be protected by some form of fire-proof shutters. Where the plan permits, the elevators, with liberal platforms, should be placed in battery side by side, for the result is more prompt, more convenient and more economical service. The process of running a van on to the elevator and carrying it up to its destination is a costly method of operation, now practically discarded. Too much time is wasted in unhitching the horses and unshipping the pole, and the corridors throughout the building must be extravagantly wide in order to permit the moving and turning of the vans; moreover, no convenient form of power exists for handling them when heavily loaded. But convenient arrangement should be made at the grade with at least one elevator to receive carriages, sleighs, etc., for storage.

In their construction these buildings are a most interesting problem to the architect. The loads they must be

STORAGE OF PICTURES, MASSACHUSETTS STORAGE WAREHOUSE.

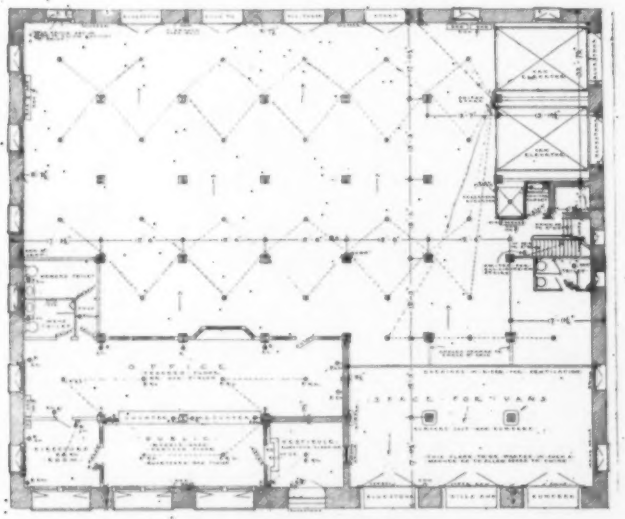
able to carry, besides their own weight, are enormous. Under different conditions and in different localities the loads vary, but the floors must carry a superimposed load of from 200 to 500 pounds per square foot of area. When such weights have to be carried through eight or ten stories, the pressure on the ground becomes tremendous, and the design of the foundations frequently taxes the skill of the most experienced engineers.

As I have said elsewhere, I believe the solid exterior wall of sufficient thickness to carry the loads, without the assistance of steel, containing only such openings as are absolutely necessary for the ventilation of the building, is the best form of construction. These exterior

UNION TRUST AND STORAGE WAREHOUSE, WASHINGTON, D. C.
Andrews, Jaques & Rantoul, Architects.

walls should be built of brick, an economical material having the greatest power of resistance to fire. Under most circumstances the greatest source of danger from fire is from the outside, and accordingly every opening should be covered with some approved fire-proof shutter, and openings coming near the ground should be heavily grilled as a precaution against robbery.

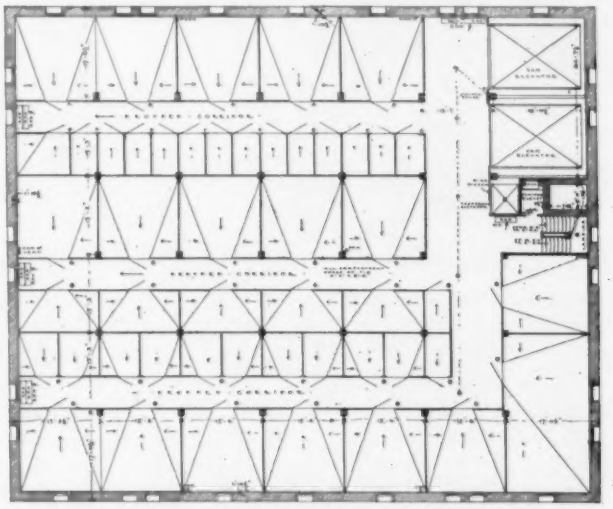
The whole interior must be framed with steel, very thoroughly protected against fire. Where fire-walls are introduced into the building they become more efficient if they are made carrying walls, that is, of sufficient thickness to carry the floors with their loads. This of



FIRST FLOOR PLAN, UNION TRUST AND STORAGE WAREHOUSE.

course makes them thicker than the ordinary requirements of the underwriters and the building laws, but the increased protection seems to warrant the small sacrifice of space. The increased cost is partially offset by the saving of a row of columns and girders, and the collapse of the building on one side of such a wall is not likely to destroy it, and under these conditions will not involve the destruction of the building on the other side. These fire-walls should have as few openings as possible, and in a newly planned building it can generally be arranged to have but one opening in each story. These openings should be protected with a double set of fire-proof doors or shutters. The amount of steel involved is a large factor in cost. Unless a judicious design for the steel framing is adopted, making the girders and beams of such spans as to use most economically the standard sizes of steel, the cost of construction will be materially increased.

Owing to danger of fire in the goods stored it is most essential to so arrange the floors as to allow the free flow of water down and out of the building without damage to the goods stored in other portions. To do this, the floors and partitions should be water-proof, and the floors should pitch towards an outside wall, through which scuppers can be arranged of sufficient capacity to carry off easily a large amount of water. Goods raised on skids would be protected from damage by water, but the better method is to raise the floors on which goods stand, including the compartment floors, slightly above the floors of the passageways, and again, the floors of the compartments should pitch towards the doors, so



TYPICAL FLOOR PLAN, UNION TRUST AND STORAGE WAREHOUSE.

that one compartment can be flooded with water, and still be drained into the passageway and out of the building without damage to other goods. In order to prevent a fire in a compartment from getting much headway every precaution should be taken against the admission of air. A good plan is to have the edges of the fire-proof doors slightly beveled to fit tightly into a beveled door frame, and these doors should be clamped with heavy refrigerator locks. When this is properly done the admission of air (the necessary nourishment of a blazing fire) is very much reduced. This tends to smother the fire, but the temperature in the compartment will gradually increase and set off the thermostatic alarm, which will notify the watchman in the office. Fire standpipes of ample capacity, with the necessary hose, should be placed so that no point in the building is more than seventy-five or a hundred feet from any one of them.

One constant source of danger to the finer goods is the vast amount of dust which is bound to exist in buildings involving so much masonry, concrete and cement, and every precaution must be taken to reduce this to the

minimum. The trucks should be rubber tired in order to grind as little as possible into the cement floors. In some cases the imported asphalt has been used for top flooring. This produces much less dust than a cement floor, but is extremely expensive and is not apt to become as hard as is desirable. Good results have been obtained by finishing the floors smoothly with a Portland cement top and covering this with two heavy coats of patent asphaltum paint. This is an economical method which, so long as it stands, keeps down the dust in the floors and can readily be renewed from time to time as the wear of the building makes it necessary.

Nothing has been found, however, better than asphalt for certain parts of the building, like the distributing platform and boiler room, which get almost constant and the very hardest usage.

The best form of elevator for freight purposes is direct steam or electric, as the elevators should stand absolutely flush with the landings to accommodate the trucking. Any form of hydraulic elevator allows a slow sagging, due to the inevitable leakage in the cylinder, so that the platform, after it has stood a few moments at a landing, has a tendency to drop, making a serious inconvenience in the prompt handling of the goods.

The temperature in these warehouses need not be more than fifty degrees, except in the specially heated compartments referred to elsewhere.

The best form of fire-proof shutter and door to be used both inside and outside is the regulation tinned shutter, built up with two thicknesses of sheathing, covered with sheet tin, with locked and soldered joints, no nails being allowed, and on the inside of the building left unpainted, as it has been found that bright tin is better than painted tin in resisting the action of fire.

I have said nothing concerning the cost of construction, a subject of vital importance to the investor and yet one that is difficult to touch upon with any degree of accuracy. The value of labor and materials in different parts of the country and the interior arrangement of the building vary in each individual case. I believe, however, that the absolutely modern warehouse, equal or superior to the most recent buildings of this type, equipped with the necessary plant required for the heating, electric, cold-storage and elevator service, with about one half of its floor area divided into compartments of various sizes, should cost between eighteen and twenty-three cents per cubic foot.

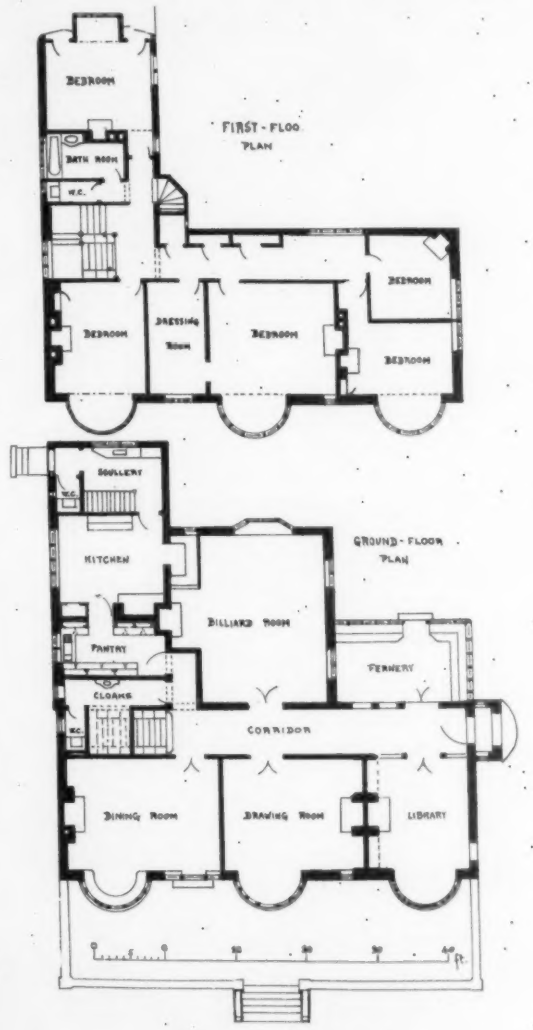
There are not many well-appointed modern warehouses in existence, but they are destined to multiply. Modern habits of changing the residence for summer and winter between continent and continent, and from section to section of our own continent, fostered as these habits are by our rapid and luxurious modes of transportation, will insure, if nothing else does, the steady growth of the modern warehouse system. Capital is already largely involved, and fair dividends are reasonably assured.

In this paper I have endeavored to emphasize throughout the conclusion on which I desire to insist, that the warehouse, however faithfully and intelligently and economically administered, will fail of the best results if it has not been *judiciously planned* and *most economically*, but *most thoroughly*, constructed.

Architectural and Building Practice in Great Britain.

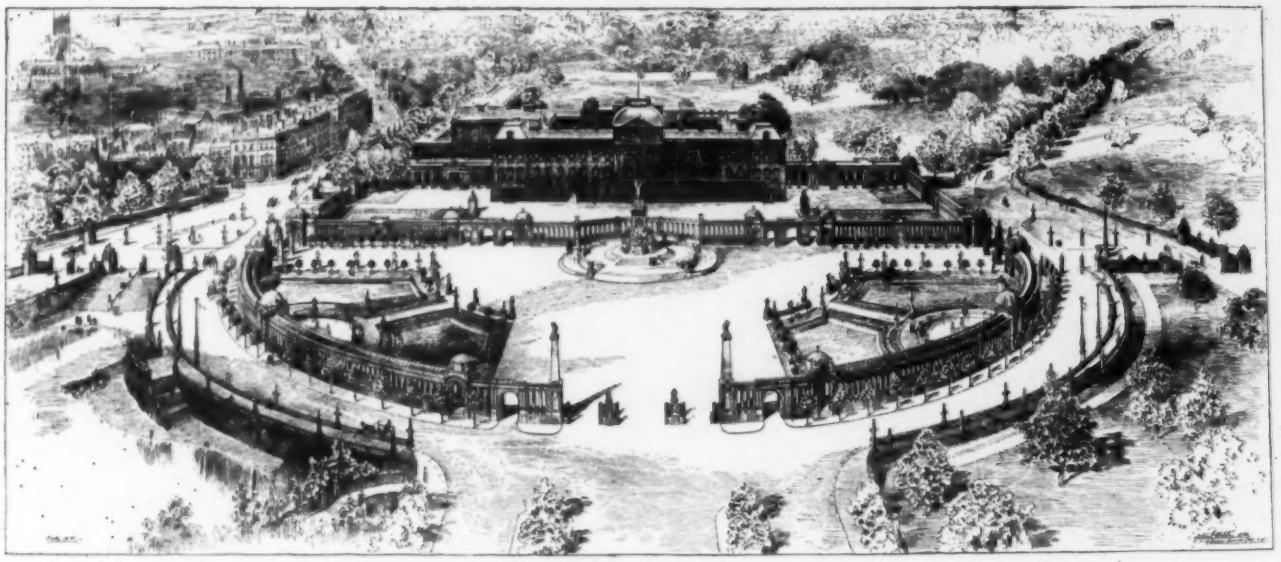
BY OUR SPECIAL REPRESENTATIVE.

AT last the five designs for the National Memorial to Queen Victoria have been exhibited. It will doubtless be remembered that, though the opinion was generally expressed that there should be an open competition, in view of the unique opportunities which such a memorial afforded, the executive committee decided



PLANS, "HILLINGTON."

that five architects only should be invited to submit designs. Mr. Aston Webb's is the selected one. It is evident from the designs themselves that certain main features were indicated beforehand, though at the commencement none of the architects knew anything very definite about Mr. Brock's memorial, for which they were to form an architectural envelope. Mr. Webb's design is, however, undoubtedly the best, though all of them possess features of interest. The railings at present in front of Buckingham Palace, which is situated in St. James's Park, are to be replaced by a stone screen forming the chord, so to speak, of a great semicircular colon-



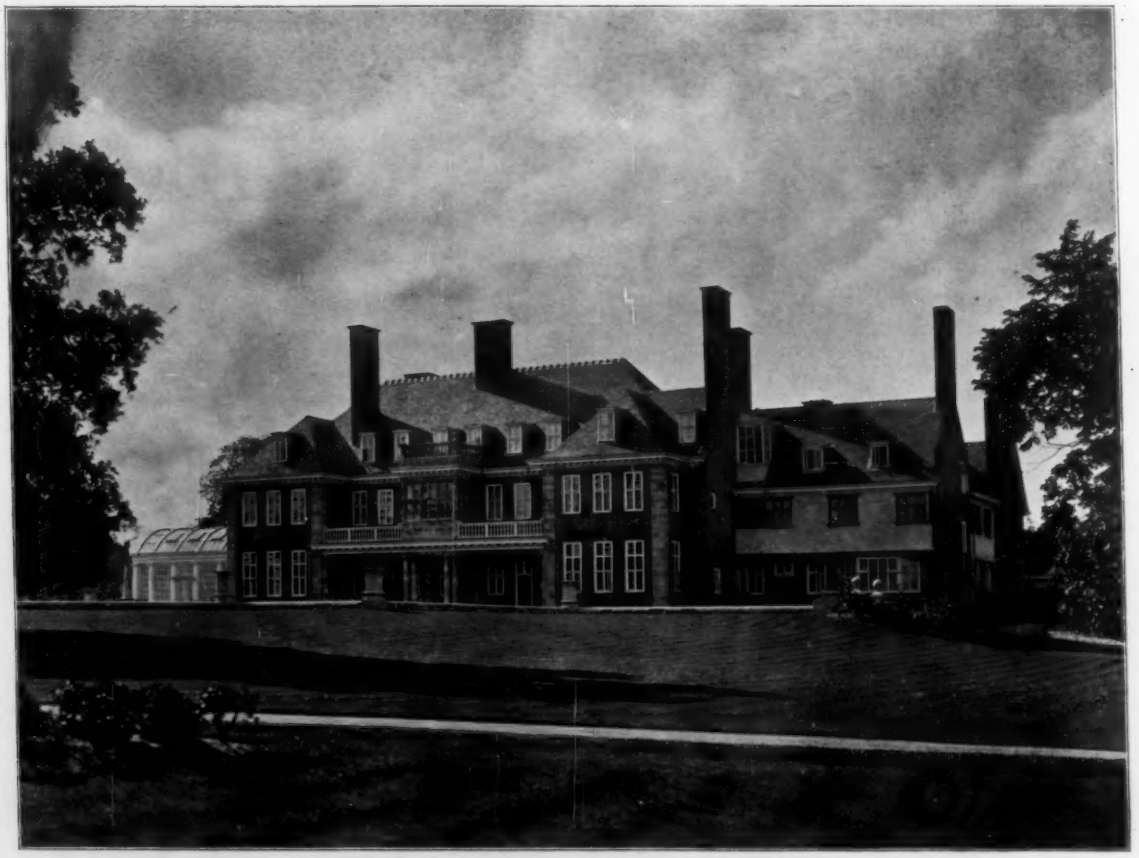
SELECTED DESIGN FOR THE QUEEN VICTORIA MEMORIAL. Aston Webb, A. R. A., Architect.
VIEW FROM WEST END OF MALL, FACING BUCKINGHAM PALACE.

nade of Ionic columns, the space thus enclosed measuring about 800 feet by 400 feet and being called "The Queen's Garden." The memorial itself, approached by a few steps having an archaic lion at each side, takes the form of a great pedestal surrounded by statuary emblematic of the empire, with a figure of her late majesty at the front; a group of sculpture crowns the whole, while at each side are arranged crescent-shaped fountain basins. The memorial occupies a central position against the screen, and at each side against the colonnade is a fountain surrounded by beds of grass and flowers. From this "garden" a central processional drive and carriage roads (intended to be adorned with sculpture) lead practically into Trafalgar Square, terminating in a circus, which is an admirable solution of a difficult problem.

Another burst of criticism has centered around the new cathedral which is proposed to be built at Liverpool. The scheme is an old one, for as long as fifteen years ago a competition was held for the purpose, but after the selection was made the matter died down. Now it has been resuscitated, and the committee have even got so far as to advertise for portfolios of drawings by June 30 next, the intention being to select a limited number of architects in this manner and to invite them to submit designs, for which they will each be paid three hundred guineas. There was enough dispute over the site, but the question of "style" resulted in greater discussion.

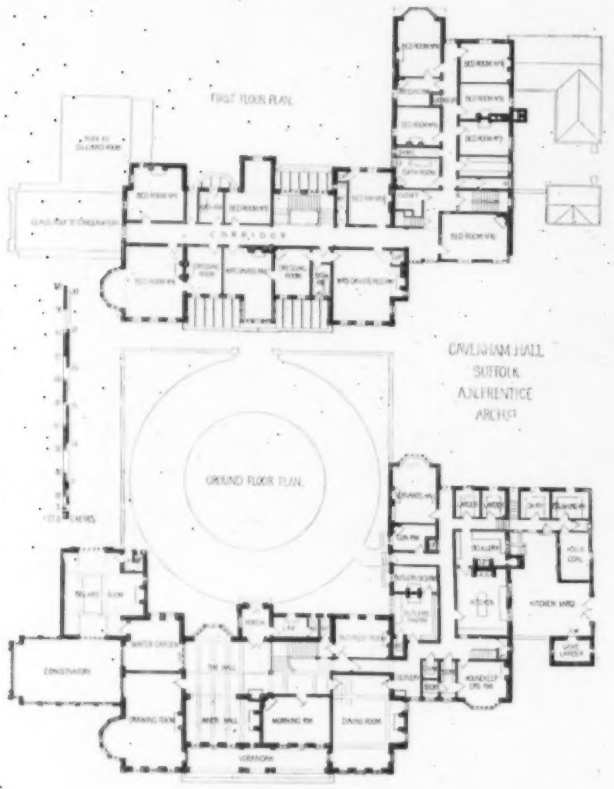
"HILLINGTON," WALTON ON THAMES. Niven & Wigglesworth, Architects.

THE LODGE, CAVENHAM HALL, SUFFOLK.



CAVENHAM HALL, SUFFOLK. GARDEN FRONT.
A. N. Prentice, Architect.

Four sites were originally under consideration, but it was soon apparent that two of them were to be relinquished, leaving Monument Place and St. James's Mount for final selection. The former is undoubtedly the better in all respects, but when it became known that the purchase money would be £200,000 the St. James's Mount site was chosen, its cost being only £50,000. This was the committee's first mistake, but matters were made

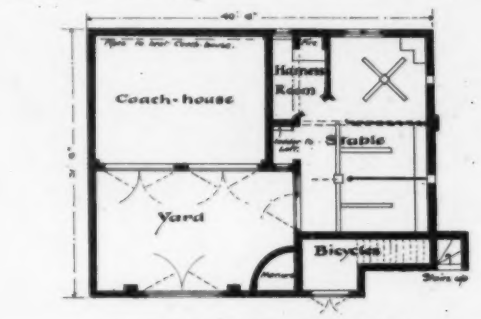


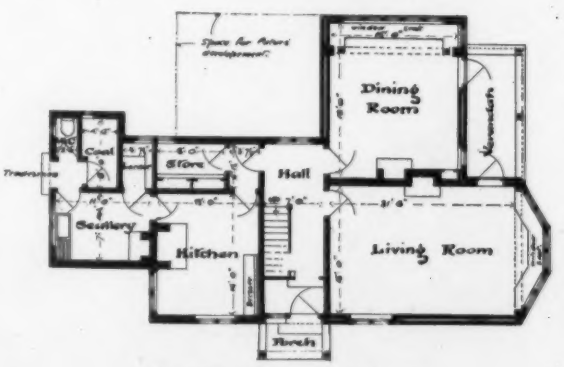
PLANS, CAVENHAM HALL.

much worse by the stipulation that the style should be Gothic. To any one familiar with the position of architecture in this country to-day it is evident that such a restriction could only result in a dead building. There is now no such thing as "Gothic" in the true sense of the word; that is to say, there no longer exists that collaboration among the various workmen which characterized the age when our great cathedrals arose, for the times have changed and the mediæval spirit is long since dead. Had the proposal been made at the time of the Gothic revival, when, with such leaders as Pugin, Street, Burges and others, a school of men was being trained to work in the manner of the old builders, it would not have been surprising; but that it should be put forward on the threshold of the twentieth century, when all around us we hear a clamoring for a new style in place of meaningless copyism, and when the finest opportunity since Wren's time offers for the building of a great cathedral, this is perfectly ridiculous, and more, it is unjust. I am, however, glad to record that the executive committee (apparently) saw the errors of their ways and rescinded their decision, so that the competition is not now restricted to Gothic designs. They deserve every credit for their action, though the feeling in informed circles is that only a Gothic design will win the competition.

Whilst speaking of cathedrals it is opportune to note that the huge Roman Catholic cathedral now being completed at Westminster from the designs of Mr. Bentley is progressing satisfactorily, and it is expected that the opening services will take place on the feast of St. Peter and St. Paul next June. But not more than the shell will then have been finished, and the mosaics and marbles will not be completed for many years to come. It is built of red brick, and its nave is higher and wider than any nave in England. Altogether the cathedral is considered to be perhaps the finest erected in modern times.

St. Paul's Cathedral was the subject of much attention a short time ago on account of the subsidences which had taken place. Alarmists were busy as usual and stories were current of the impending collapse of the structure. The actual facts are that owing to underground tunneling the ground has consolidated somewhat, resulting in the dislocation of the arches of the nave, choir and transept, and, more important, the subsidence of the west front with its heavy towers and bells. Moreover, the





PLANS, "GALLOPS HOMESTEAD."

whole of the southern transept has moved, so to speak, towards the Thames. In order that no further harm may be done, there must be no more "tubes" in the close vicinity of the cathedral, — the Central London Underground Railway on the north is only 460 feet from the center of the dome, yet the new line from Piccadilly proposes to come 160 feet nearer; but it is improbable that the powers sought will be granted, for the Dean and Chapter intend to oppose all such schemes. It is somewhat ironical that, while money is being wasted inside on Sir William Richmond's foreign decorations, there are no funds available for structural works to assure the stability

of the fabric, — not enough to keep the building in thorough repair; and we even allow Mr. Pierpont Morgan to pay for the cost of installing the electric light.

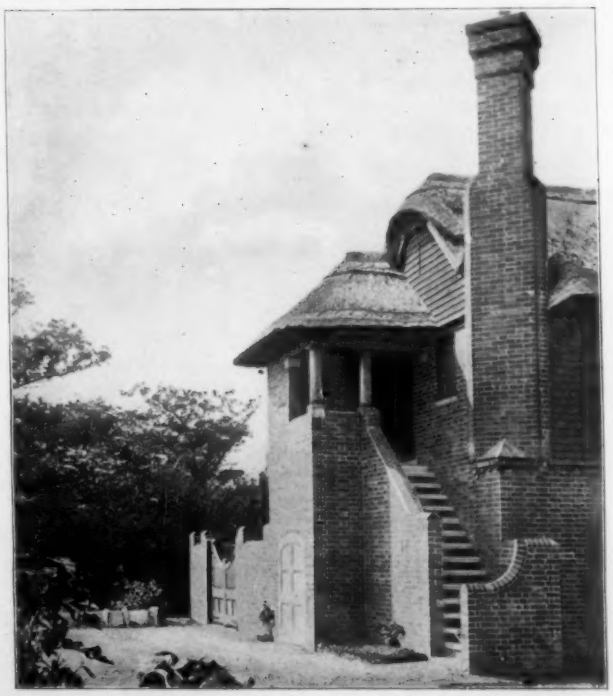
The building trade in this country at the present time is in a very bad state, due to the war and the continued high price of materials and labor. In many parts it is practically at a standstill. Wages are proposed to be reduced in order to revive conditions.

In this letter I should not omit reference to the death of Mr. James Brooks, one of the best of our modern church architects. He almost exclusively employed brick in his churches, which were characteristic for the excellent proportion observed in the buttresses and the concentration of what little ornamentation there was. Mr. Brooks was a man of sturdy solid character, and this is reflected throughout his work. His churches, like St. Michael's, Shoreditch, London, or St. Mary's, Haggerston, London, were in poor districts and the money at his disposal was consequently limited; yet the general excellence of their design is a striking testimony to the great ability of this architect.

I may refer, in conclusion, to the several illustrations which accompany this letter.

The house at Walton-on-Thames, by Messrs. Niven & Wigglesworth, is of brick with red-tiled roofs and modeled plaster work on the bays. A feature has been made of the lead work in the gutters and down-pipes. It is an excellent specimen of modern English domestic architecture.

"GALLOPS HOMESTEAD," SUSSEX.
C. B. N. Quennell, Architect.



OUTSIDE STAIRS TO STABLE, "GALLOPS HOMESTEAD."

Cavenham Hall, Suffolk, is Mr. A. N. Prentice's most important work. It is built of red brick, with stone dressings, portions being treated with decorative plaster work; the roofs are covered with red tiles. Particular attention is drawn to the plan, which is considered to be one of the best examples of the planning of a large English country house. The treatment of the conservatory is also worthy of special notice.

"Gallops Homestead," in Sussex, consists of a cottage with detached stables, the cost of the former being about £1,000 and of the latter £600. It was built as a summer residence and is of red brick with roughcast here and there, and a thatched roof. Thatch, it should be noted, is very rarely employed now, though it forms a most admirable covering, being warm in winter and cool in summer time; while in outlying districts the risk of fire is so slight that it may be disregarded. Its picturesque appearance is evident.

Fire-proofing.

RATIONAL METHODS OF FIRE-PROOFING. II.

BY WILLIAM COPELAND FURBER, M. AM. SOC. C. E.

IN a previous paper (BRICKBUILDER for July) the maximum strength of iron was shown to be at a temperature of about 400 degrees Fahrenheit, and it was also shown that for each increase of 100 degrees the resistance was decreased 10,000 pounds per square inch of cross section.

When all the experts on fire-proofing, all the engineers and architects and all the manufacturers have reached a common ground in admitting that the present methods of fire-proofing are insufficient, and the fire insurance companies have formulated objections to the present methods and have modified their rates so as to encourage the erection of real fire-proof buildings, then we can properly discuss the details of better methods, but as a suggestion of how easily a great improvement can be made the following discussion is set forth.

COVERING OF FLANGES OF BEAMS.

Beginning with the weakest point admittedly in the present methods, that of the covering of the floor beams, let us see what led to the adoption of the present standard type of hollow tile floor and beam covering, and what reasons, if any, exist for its continuance.

The possibilities of modern skeleton building (and also in a general way the fire-proofing proposition) began when the first iron beam was rolled in 1853. The buildings in which these beams were used followed in floor detail the wood-joist construction, which required flat ceilings. The flat ceiling became then, in the usual process of adapting the new to the old, an essential part of the design of the new system; not by special construction, but by the force of habit of mind which clings to the old form as long as no change is imperative.

In the early structures, when the iron beam and the solid brick arch succeeded the wooden joist, the designers supposed that all demands of fire-proofing had been complied with by the substitution of non-combustible material for wood; and while this was a great advance, it was but the beginning of a new epoch in building construction. Experience soon showed that the lower flange of the beam could be injured by a quantity of heat which was not at all sufficient to seriously affect the floor material itself. When this fact became apparent, the obvious thing to do was to cover this flange; so to-day we see the flange covered with a thin piece of tile that merely covers the beam from view and performs a very slight service as a non-conducting cover. This little piece of tile is there, however, because the ceiling is mistakenly supposed to be required to be flat.

In a building of any pretensions there is but little reason or excuse for a flat ceiling. The possibilities the projecting beams afford for architectural treatment are so great and so promising that it is surprising that they have not been taken advantage of in the past.

The elaborate ceiling enriched with forms of free and geometric relief was a characteristic of the highest architectural development, and from the record we have of the past we can see there was no effort made to deny the character of the overhead construction, but on the contrary the beam was frankly admitted and treated as worthy of consideration and decoration. It is hardly necessary, however, to point out here the precedents for the architectural treatment of ceilings, but it remains for us to suggest how simply and easily the demands of fire-proofing can be complied with, and also that by complying with these demands we have additional opportunity and incentive for rational decoration at but little increase in cost.

Let us begin by admitting that the floor beam needs protection, and let us cover the lower flanges with an ample thickness of cellular tile; let this projecting tile cover be admitted for what it is, and let moldings and decoration be applied to it. Where low cost is absolutely necessary, the projecting beam covering can be plastered the same as the flat part of the ceiling, with no moldings or elaboration; by returning the one half of the beam projection across the ends of the room, between the beams, a dignified treatment of the ceiling is possible with little additional cost; where a better treatment is possible the ceiling can be subdivided into panels by cross false beam, covers made of "staff" or wire lath fitted in between the beam coverings and finished in plaster to correspond to the beam coverings.

The only special consideration this method requires to permit architectural treatment is that the ceiling beams should be placed so as to permit a symmetrical arrangement of the ceiling panels; this is a simple matter usually, as the beams are frequently placed to suit the partitions, and the other condition then naturally follows.

In putting the beam covering in place it would be advisable to insert a piece of wire-mesh fabric in the outer joints between the two adjoining skew backs, covering their projecting edges and the lower flange tile; this can readily be done while the skew backs are being set. The wire netting, by preventing the possible falling off of the tile in case of mechanical injury, insures the flange from the action of the flames, and also furnishes a good foundation for the plaster, thereby utilizing its additional thickness.

A beam covering of from four to six inches can be made on these lines that will afford a large amount of protection to the beams and insure their strength under any but the most trying conditions and at but a slight additional cost over the present methods. If a ceiling that has been subjected to the action of fire and water alternately is examined, many of the flange tiles will be discovered missing. Yet this manifest and vital defect is usually passed over without comment.

The girders, because they are the main lines of horizontal support, should have a greater thickness of covering than the beams. The detail of the covering should be carefully studied out to fit the conditions of exposure.

THE COVERING OF COLUMNS.

The present standard details of hollow tile coverings for columns, while much better in some respects than the present beam coverings, yet are hardly equal to their

responsibilities. While they are usually thicker than the beam coverings, yet the method of attaching them to the columns and to themselves is far from satisfactory.

In general it may be said that the beams and girders have the greatest exposure in the ceiling because they are at the top of the room and in the zone of probable maximum temperature, and while this is true, yet the column is more important structurally because its failure would cause the failure of all other members dependent upon it; and moreover the chances of local maximum temperature are very great. For these reasons, therefore, the column covering demands consideration in proportion to its importance.

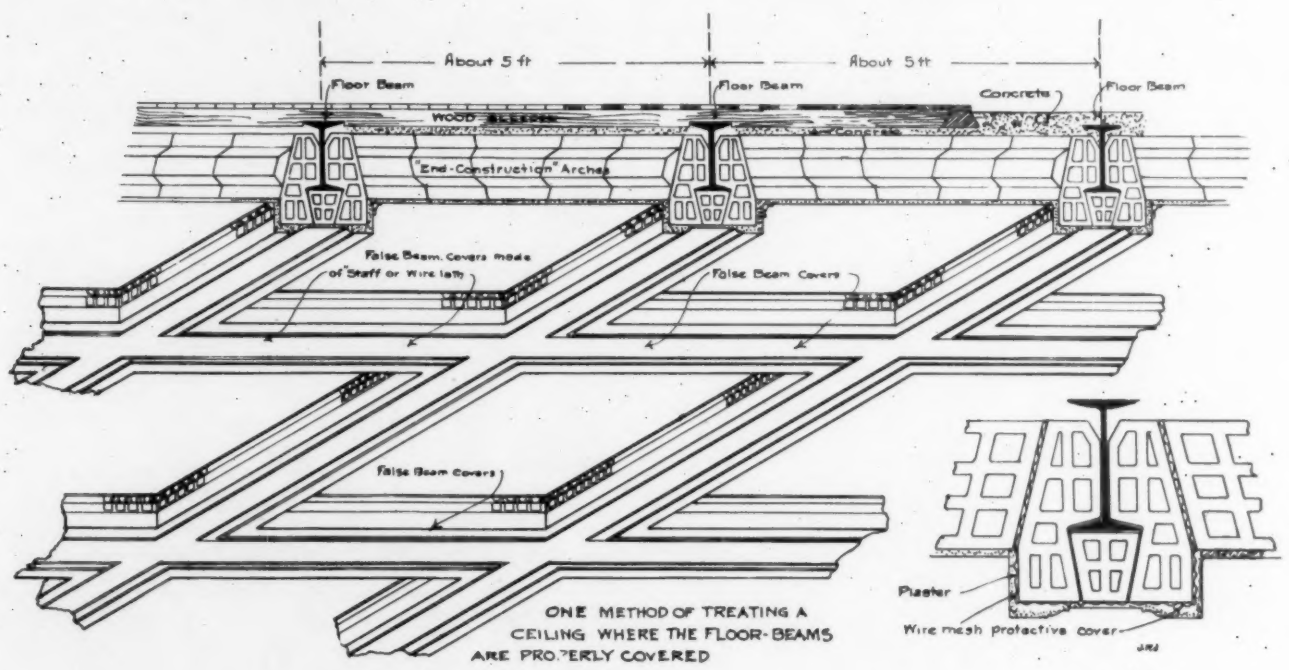
It should not be overlooked in considering the fire-proofing of structural members, and particularly of columns, that rust-proofing should also be considered at the same time. No structural member should be left unprotected in any position where moisture can possibly penetrate. The very first step, therefore, in fire-proofing exposed columns and girders should be to cover them with an impervious covering, which will prevent rust. The discussion of the rust-proofing question, while germane to this subject, is too long to be inserted here; however, in brief it may be said that the structural work intended to be covered with concrete should not be painted but given a temporary coat of oil. Paint prevents adhesion of the cement to the metal surface. Rust is caused by three factors working together — oxygen, an acid and water. By excluding all three of these factors, or by excluding one or more, rust cannot take place. Portland cement, because it is a product of lime, furnishes a base which will neutralize any acid likely to be present under ordinary conditions. If the metal work is first enclosed in an envelope of Portland cement concrete made with a liberal proportion of mortar, with neutral sand and rock, well rammed into a homogeneous mass, filling all vacant places, forming an unbroken cover, and allowed to harden, the column or girder will never rust; and if on this basis the fire clay covering of sufficient thickness is put on, the structural member can be relied on always to perform its office in a satisfactory manner. If the concrete envelope is omitted and moisture finds its way to the metal, no matter how carefully it is protected from fire, there will come a time when the column will fail without being subjected to a fire test.

The concrete covering, moreover, because it furnishes such a good backing, permits the attachment of the fire clay covering in a thoroughly satisfactory manner. When the columns are not exposed and the cement envelope is omitted, great care is necessary to give a basis or backing for the hollow tile, and the covering should be so designed as to utilize in the most effective way the shape of the column as a backing for the tile.

In the concrete-covered column a standard-shaped tile covering can be made which will fit all the columns, but where the tile has to fit the iron work a satisfactory standard shape is hardly possible.

In all column coverings, as the possibility of mechanical injury is very great, the wire fabric or lath protection should never be omitted.

The question of the limit of space to be occupied by the column and the beam and their coverings should not be considered only from the point of how little covering will conceal the metal, but from the standpoint of how much thickness is necessary to fire-proof it. If the object to be attained is only to cover the structural members with tile, then it would be useless to suggest even a minimum of four inches (yet this is hardly sufficient). If the object is to build a fire-proof structure, it should be consistently done, and whatever space is required for proper coverings should be allowed for, and this allowance not cut into for *any* reason.



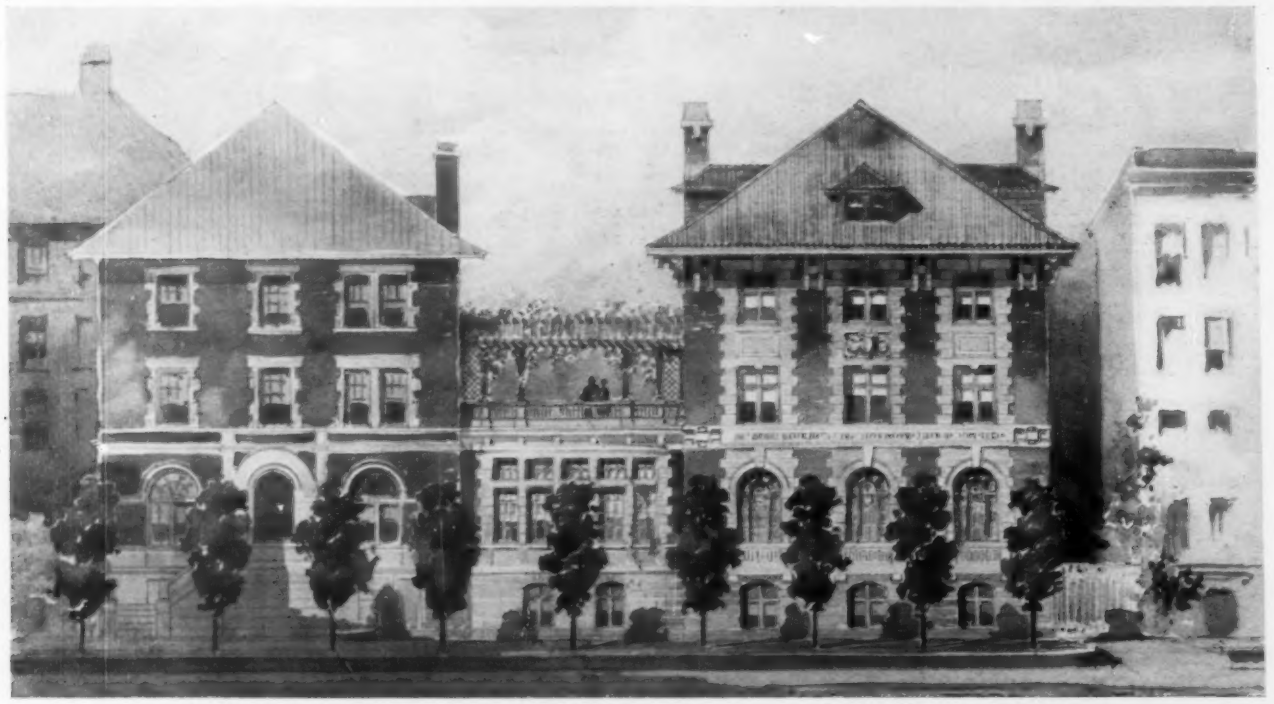
ONE METHOD OF TREATING A CEILING WHERE THE FLOOR-BEAMS ARE PROPERLY COVERED

Selected Miscellany.

NOTES FROM NEW YORK.

In a recent optimistic editorial in the *Tribune* entitled "A City of Great Deeds" attention is called to the truly remarkable activity now prevalent in the building trades and among architects. "Underground, at the surface and far up in the air big armies of wage earners are toiling on railway lines and bridges, on churches and exchanges, on huge structures which will be used for national or municipal purposes, on enormous hotels and apartment houses, on office buildings and department stores of ambitious proportions, on new piers and elevators, on new schoolhouses and new parks." Naturally these great achievements make us all happy and contented, and we only hope that the new year may bring a continuation of happiness and prosperity.

DETAIL BY WILLIAMSON & SPENCER, ASSOCIATE ARCHITECTS.
Northwestern Terra-Cotta Company, Makers.



BROOKLYN HOME FOR AGED MEN, BROOKLYN, N. Y. Lord & Hewlett, Architects.

The last monthly dinner and meeting of the League was particularly interesting and well attended. The subject for discussion was "Church Decoration," and although the principal guests, Bishop Potter and Archbishop Corrigan, were unable to attend, there were other able speakers among the clergy present who made interesting addresses. After the enjoyment of the very good dinner, Mr. W. L. Harris, a member of the League, delivered a lecture on "Stained Glass," illustrated with lantern views, which was thoroughly enjoyed. Mr. John La Farge gave an impromptu talk on the tendencies of modern art. The point which he emphasized most strongly was the fact that it is the desires and temperament of the people which will draw from artists and artisans their best work. If there is a demand for good, thorough, honest work, such work will be produced. Committees were appointed by the president, Mr. Hardenberg, to draw up resolutions of sorrow at the decease of two League members, Mr. Thomas and Mr. Morgan.

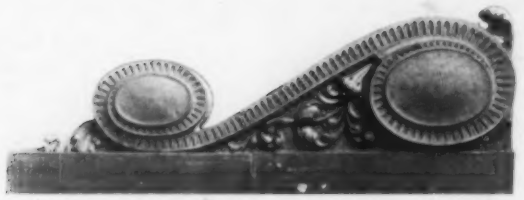
DETAIL BY BARNETT, HAYNES & BARNETT, ARCHITECTS.
Winkle Terra-Cotta Company, Makers.

Our neighbor city, Newark, is soon to have two new buildings which will be refreshing landmarks in a city which is almost entirely devoid of interest architecturally. The Newark City Hall competition, which was a competition open to all, has been decided in favor of Mowbray & Uffinger of New York; and the Newark

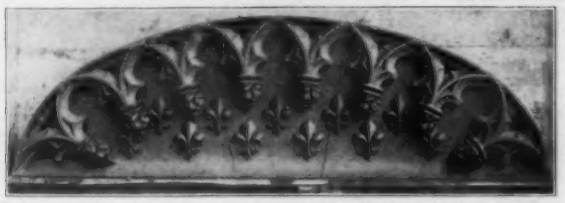
DINING-ROOM.

HALL AND MAIN STAIRWAY.

HOUSE AT CHICAGO, ILL. William A. Otis, Architect.



BRACKET EXECUTED IN TERRA-COTTA BY NEW JERSEY TERRA-COTTA COMPANY.
C. B. J. Snyder, Architect.



DETAIL BY BARNEY & CHAPMAN, ARCHITECTS.
Atlantic Terra-Cotta Company, Makers.

courthouse competition (limited) has been awarded to Cass Gilbert of New York. The latter building will cost about $1,000,000.

The committee in charge of the Carnegie libraries to be built in this city and Brooklyn have appointed the following Brooklyn architects to prepare plans for the first five libraries to be built there, viz.: Lord & Hewlett, Walker & Morris, R. L. Daus, William B. Tubby & Bro. and Raymond F. Almirall.

The Sons of the American Revolution will erect a handsome clubhouse on Fifty-fifth Street from plans by York & Sawyer.

KENNARD BUILDING, ST. LOUIS, MO. Isaac Taylor, Architect.
Built of American-size gray coated impervious brick, manufactured by the Hydraulic Press Brick Company, St. Louis, Mo.

NOTES FROM ST. LOUIS.

The closing months of the year have been busy ones in building circles, the report of the building commissioner indicating an improvement of 100 per cent over last year. The activity is not confined to the offices of architects who were fortunate in being selected as members of the board of architects for the Exposition work, but is general, and the outlook for the coming year for important work in the business sections of the city is more promising than for many years.

DETAIL EXECUTED BY WHITE BRICK AND TERRA-COTTA COMPANY.

Weber & Groves have prepared plans for a hotel 50 by 100 feet to cost $65,000.

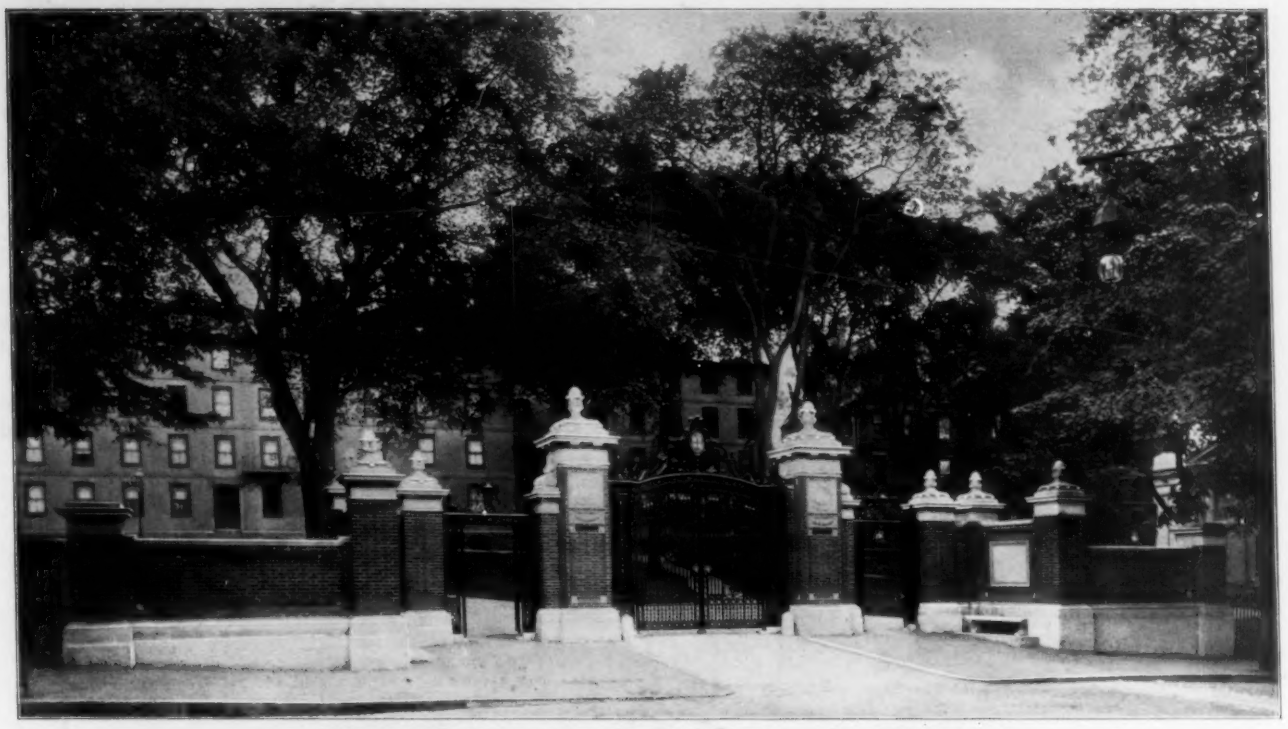
Mauran, Russell & Garden have been selected as the architects for the Christian Science temple, which will be built on Lindell Boulevard at a cost of $100,000. They have also the library for the Kansas Normal School at Emporia, Kansas, a $60,000 building.

The St. Louis Portland Cement Company has employed Isaac S. Taylor as its architect for the large plant to be erected along the Burlington Railway tracks in north St. Louis.

The smoke problem is one that has been a source of annoyance in the city for a long while, notwithstanding several efforts to abate it; but a rather unique incident in connection with it occurred recently, when a tenor in one of the leading opera companies instituted proceedings for damages, claiming the smoke had injured his voice.

In Exposition work some progress has been made, the contract having been awarded for enclosing the site. The general scheme

DETAIL BY JARDINE, KENT & JARDINE, ARCHITECTS.
Standard Terra-Cotta Works, Makers.



VAN WICKLE MEMORIAL GATES, BROWN UNIVERSITY, PROVIDENCE, R. I.
Hoppin & Ely and Hoppin & Koen, Associate Architects. Built of Fiske & Co.'s (Boston) Rough Texture Red Face Brick.

has been determined, and it is expected that the formal dedication of the site will be made on the 20th of December. Besides the 400 acres of forest park, the grounds and new buildings of Washington University will be used.

The plan of the grounds will differ from plans of preceding exposition grounds, inasmuch as the numerous avenues will radiate from the main entrance, the general plan being fanlike in form. At the end of the central avenue the Art Building, by Cass Gilbert, is to be situated on an eminence about 60 feet in height. Cascades in the form of a crescent, issuing from the sides of three hills, will form a basin at the foot, and the other buildings will be situated on either side.

The alumni of the University of Virginia propose to reproduce the rotunda of the university building on the grounds as a permanent monument to Jefferson.

Eames & Young have been employed by the Travelers' Protective Association as the architects for a 2,000-room hotel near the Exposition grounds.

NOTES FROM PITTSBURG.

We think THE BRICKBUILDER a little severe and somewhat mistaken in the editorial on the Carnegie Technical Institute, published in the October number. That the architectural student should make better progress when

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George S. Cooper, Architect.
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DETAILS EXECUTED BY ST. LOUIS TERRA-COTTA COMPANY.

that there is a wide field here for a good architectural department, and we believe that the trustees will see that it is the best.

The student at Cornell is probably not surrounded by buildings of the highest merit, but no one will deny the value of the work that its architectural department is doing.

The University of Chicago has, in a few years, by means of its great endowment, risen from nothing to one of our greatest colleges.

Pittsburg architecture is not all bad, and the new school will undoubtedly be well housed, while the large endowment promised by Mr. Carnegie will do much to bring here the best instructors, books, casts, etc.

Mr. E. B. Lee, Harvard, '99, at present in the office of Alden & Harlow, has been awarded the Austin Traveling Fellowship for this year by Harvard University. Mr. Lee expects to sail for Europe in the spring.

The fallacy that borings can be altogether relied upon to determine the nature of soil was recently shown here in the work on the site for the new building for the Farmers' National Bank. Borings showed that the soil was composed of loose, wet sand for at least sixty feet below curb level; excavation, however, showed that at twenty-six feet there was a formation somewhat resembling concrete. Composed of gravel and sand, it was so hard as to require the constant use of the pick to remove it. The drill had loosened it and brought up the loose sand.

surrounded by fine architecture is true, but in these days of inexpensive photography, books and magazines, the best from all countries and places can be readily put before him, imperfectly, it is true, but, accompanied by wise criticism, invaluable. We believe

DETAIL BY FRANCIS H. KIMBALL, ARCHITECT.
Conkling-Armstrong Terra-Cotta Company, Makers.

IN GENERAL.

The entire front of the new building for the Rochester Telephone Company, illustrated in the plate form of this number, is of terra-cotta, quite a good deal of which is in color. The work was executed by the Perth Amboy Terra-Cotta Company.

The Atlantic Brick Manufacturing Company, Philadelphia, whose advertisement appears for the first time in this month's number, is a new concern which is under the management of men who have had a thorough training in the manufacture and sale of brick. They have placed upon the market a high grade, stiff mud front brick in buff, gray, mottled and iron spot colors, in standard and Roman sizes. They are prepared to send to architects and builders, charges prepaid, a full line of samples with prices.

Carl Kusche, architect, 242 10th Street, Oshkosh, Wis., would be glad to receive manufacturers' catalogues and samples.

October last an architectural club was organized in Kansas City, under the title of the Kansas City Architectural Club. It was started with fifteen charter members and the following officers: John van Brunt, president; William H. Cutler, vice-president; Charles H. Payson, secretary; and Fred E. McIlvain, treasurer. It has engaged club rooms in connection with the Kansas City Chapter, A. I. A., and already has one competition under way, the subject being a band stand, to be located in one of the parks of the city.

DETAIL BY WHEELWRIGHT & HAVEN, ARCHITECTS.
Excelsior Terra-Cotta Company, Makers.

M 161

HOUSE AT CHICAGO, ILL.

WILLIAM A. OTIS, ARCHITECT.

HOUSE AT MORRISTOWN, N. J.

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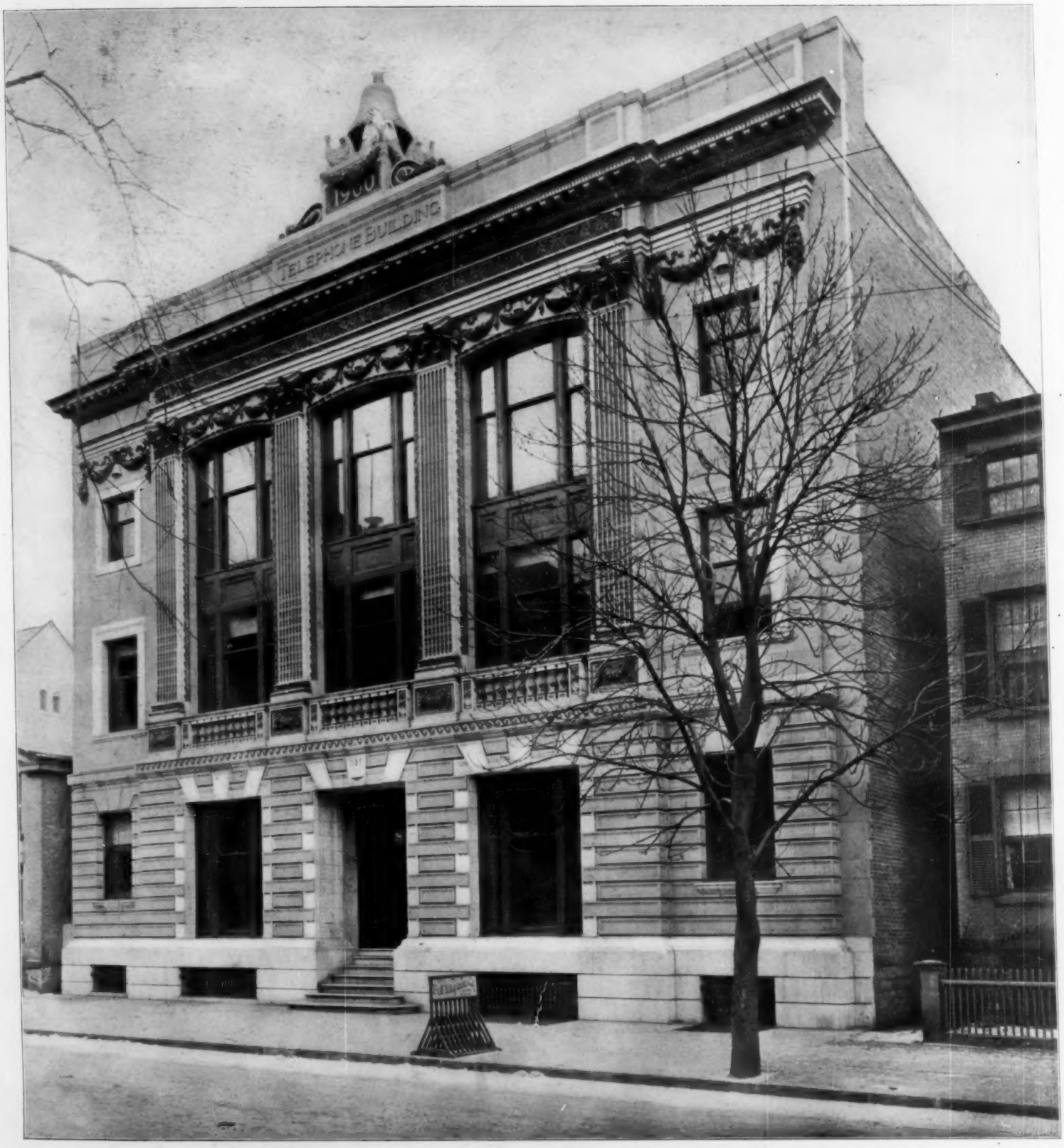

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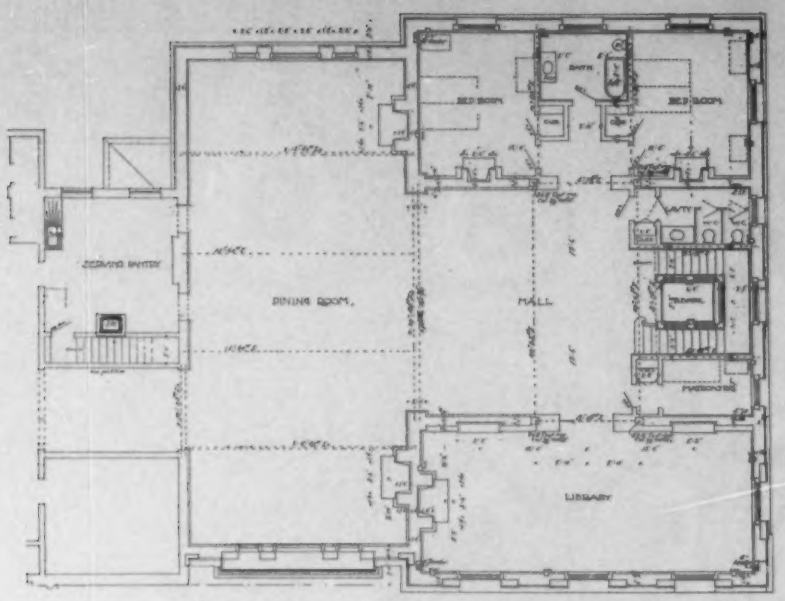
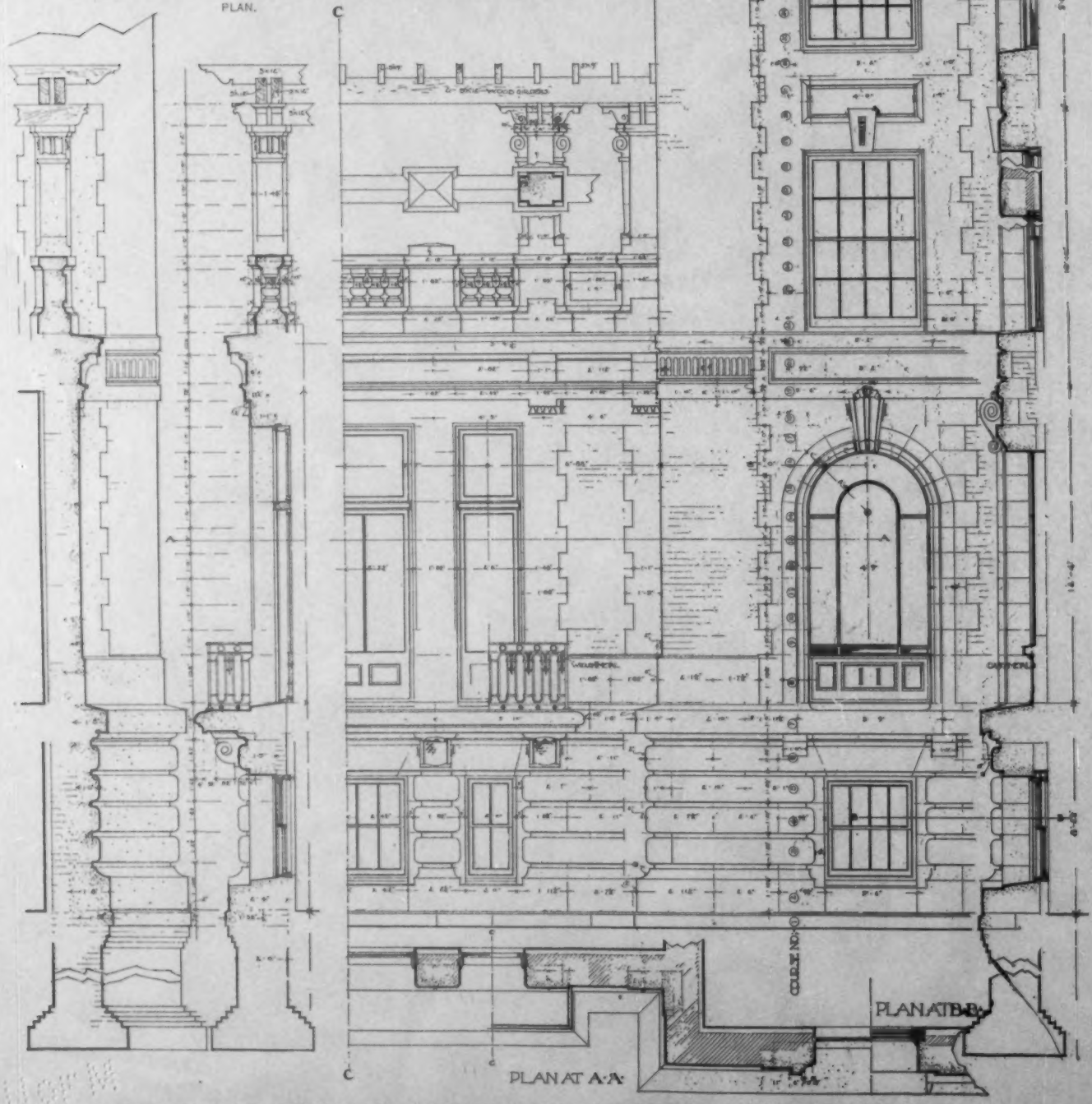
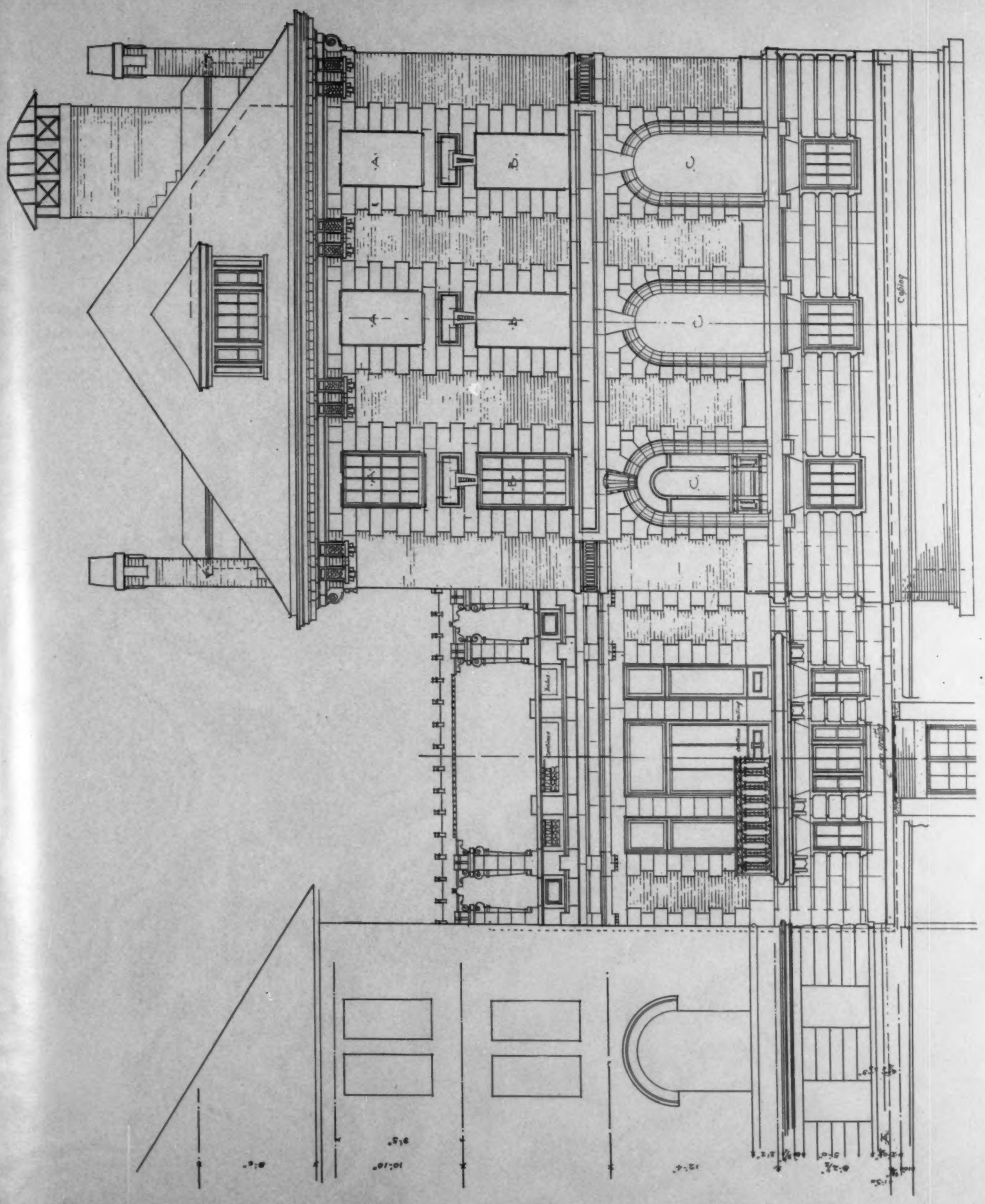


PLAN.



DETAILS, FRONT ELEVATION, BROOKLYN HOME FOR AGED MEN, BROOKLYN, N. Y.

LORD & HEWLETT, ARCHITECTS.



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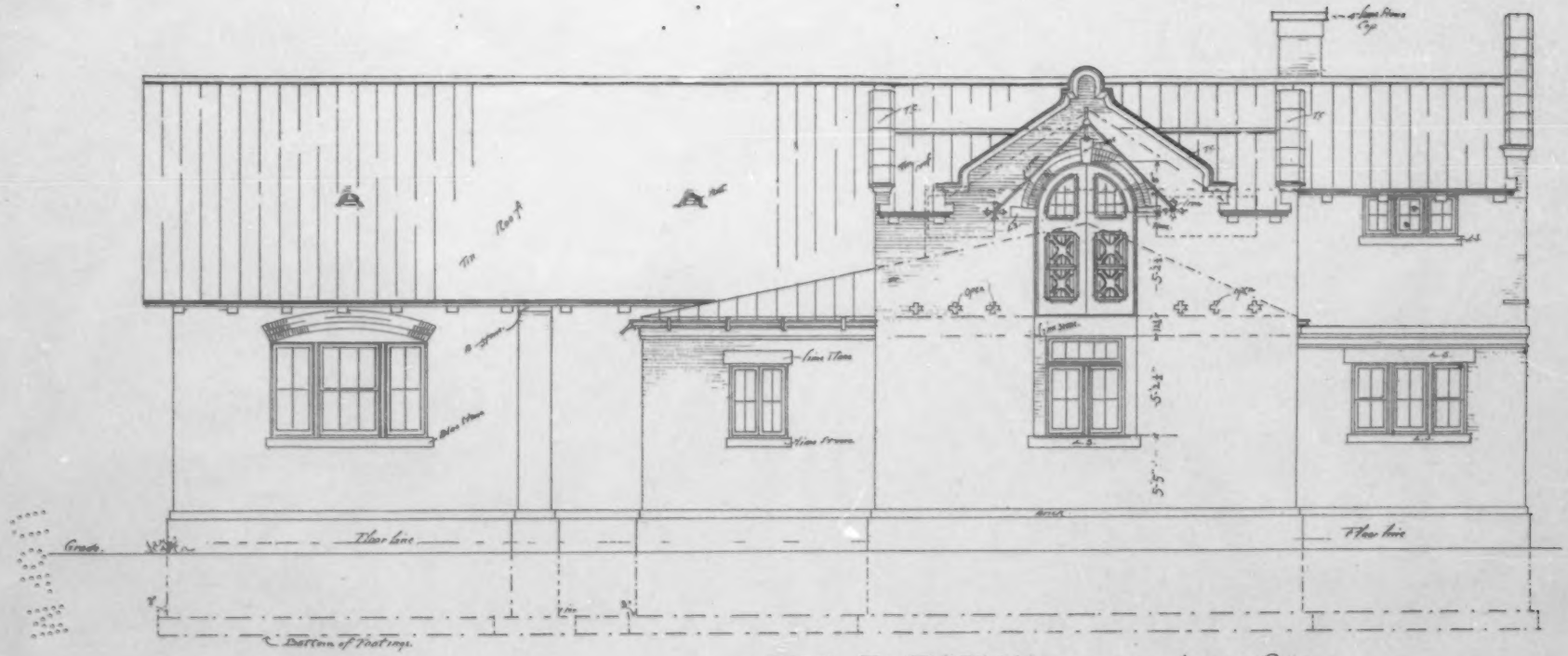
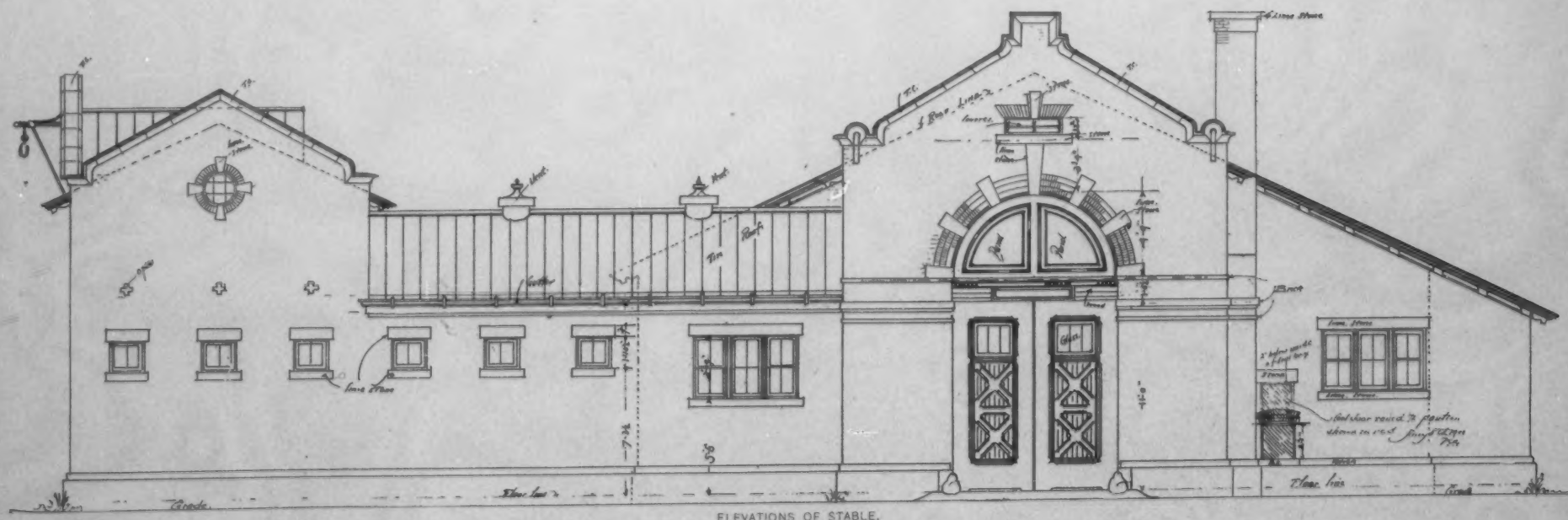


SIDE ELEVATION — scale ¼" = 1 foot



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HOUSE AT MORRISTOWN, N. J.

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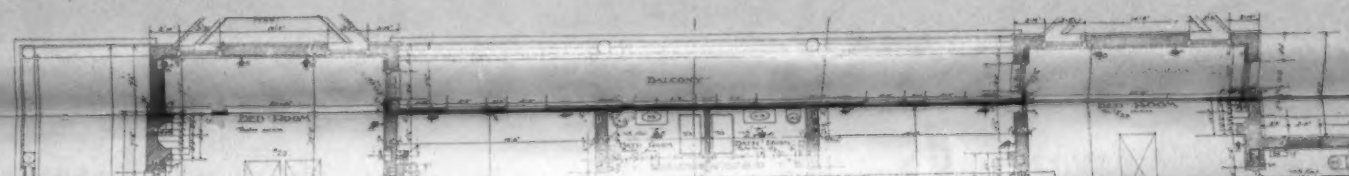
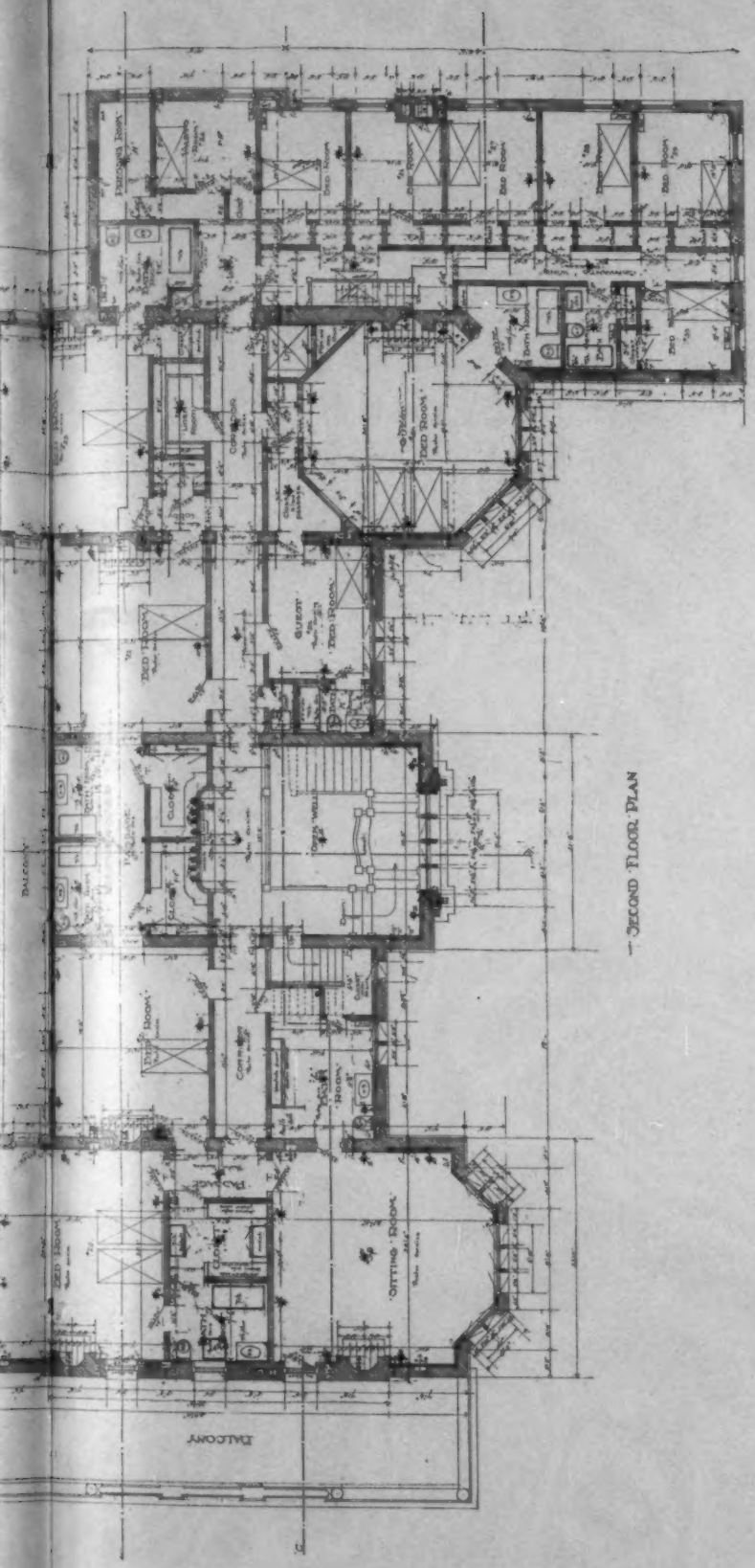
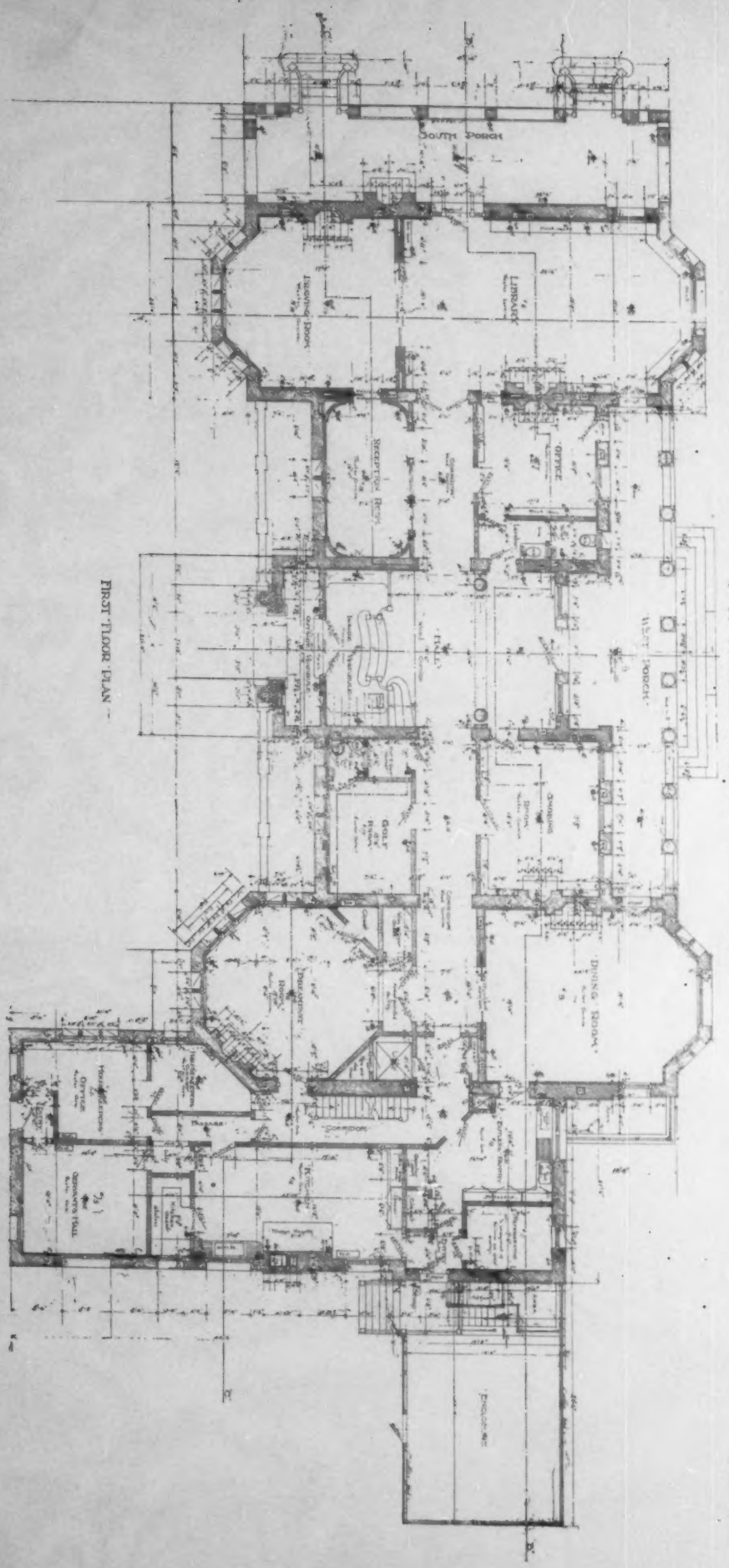


PLATES 90 and 95.

PLANS, HOUSE AT MORRISTOWN, N. J.
HOWELLS & STOKES, ARCHITECTS.



— SECOND FLOOR PLAN



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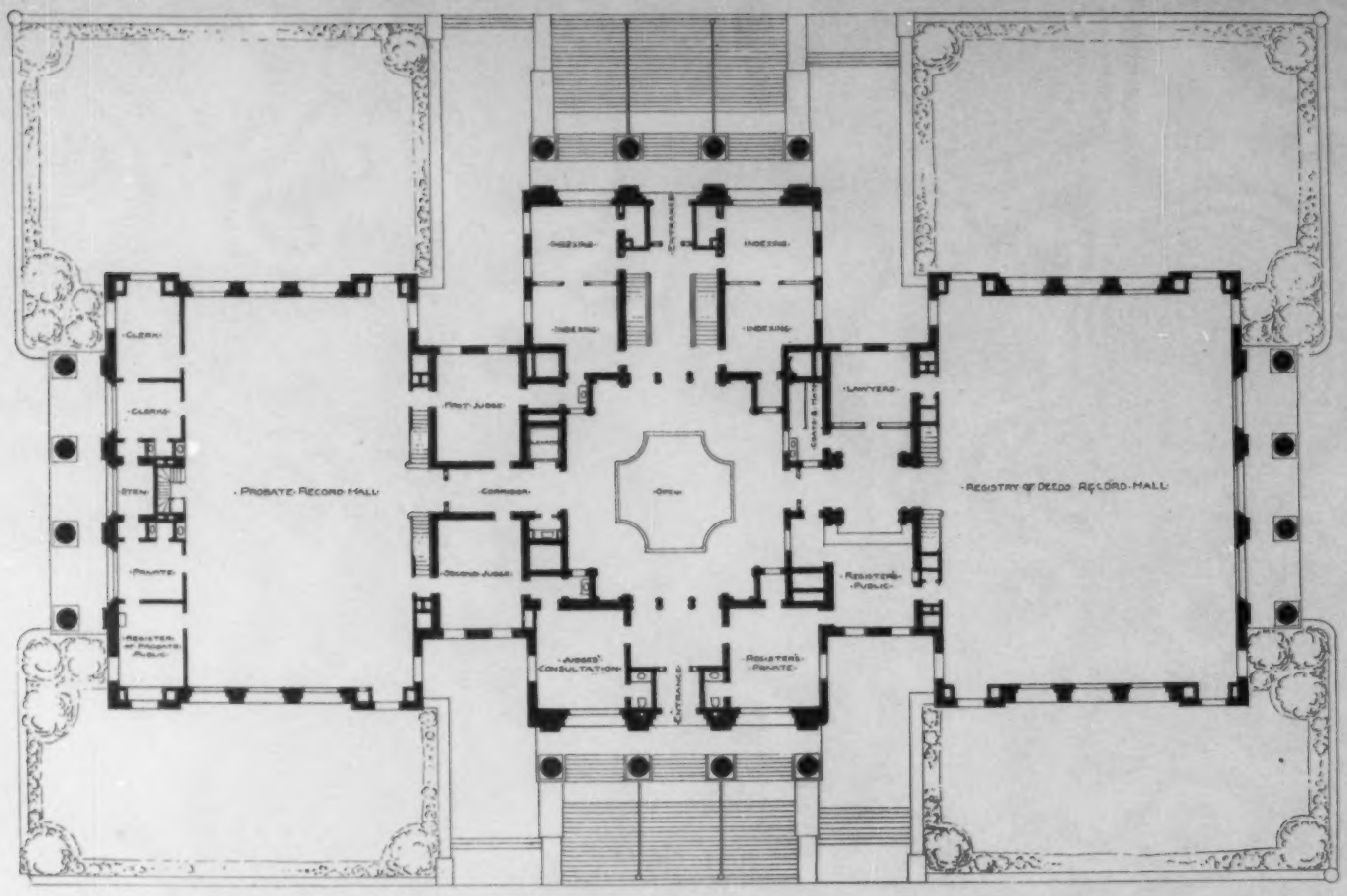

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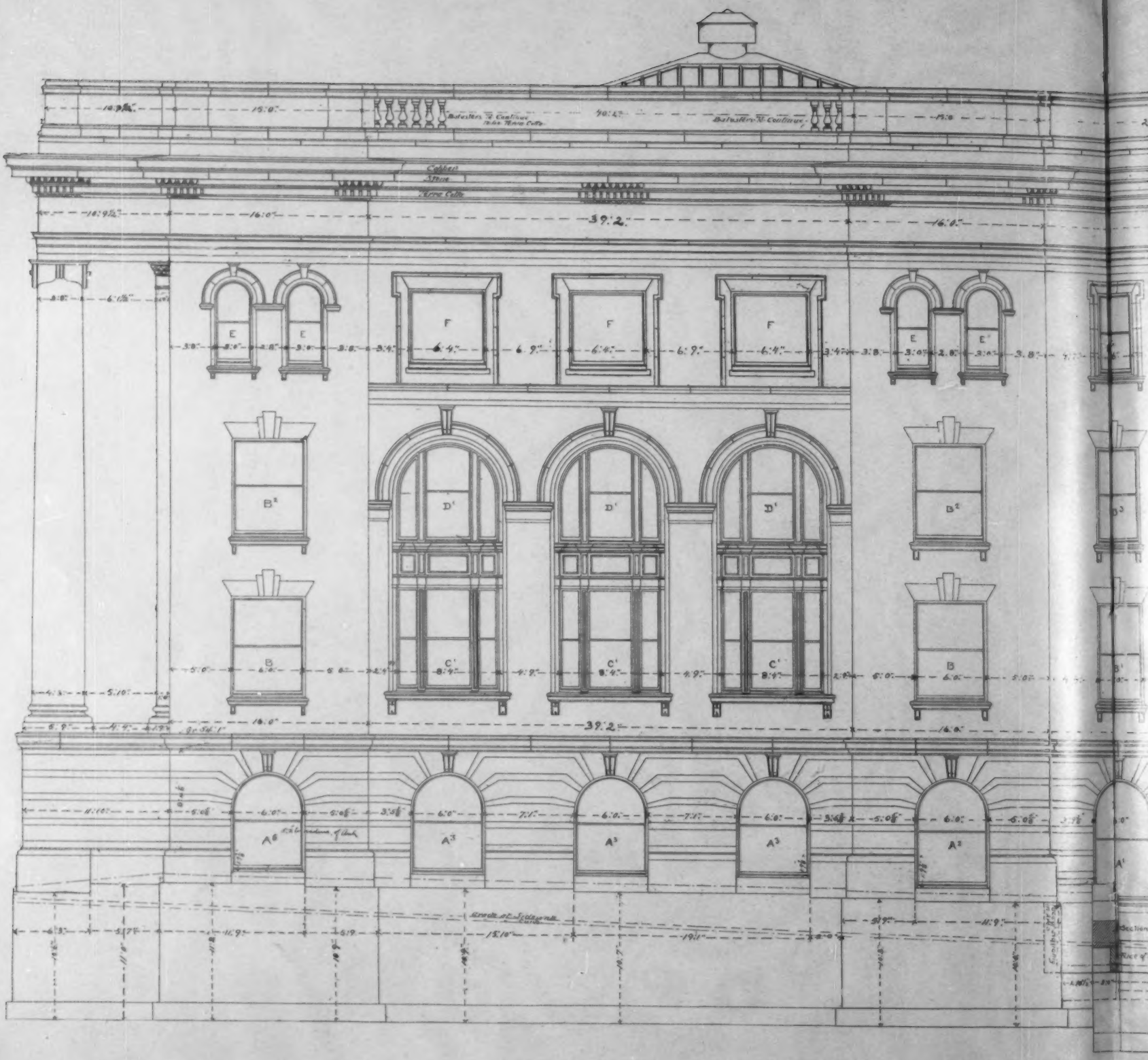

FRONT ELEVATION

MIDDLESEX COUNTY REGISTRY OF DEEDS AND P

OLIN W. CUTTER, AR

PLATES 92 and 93.

FRONT ELEVATION.

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W. CUMMER, ARCHITECT.

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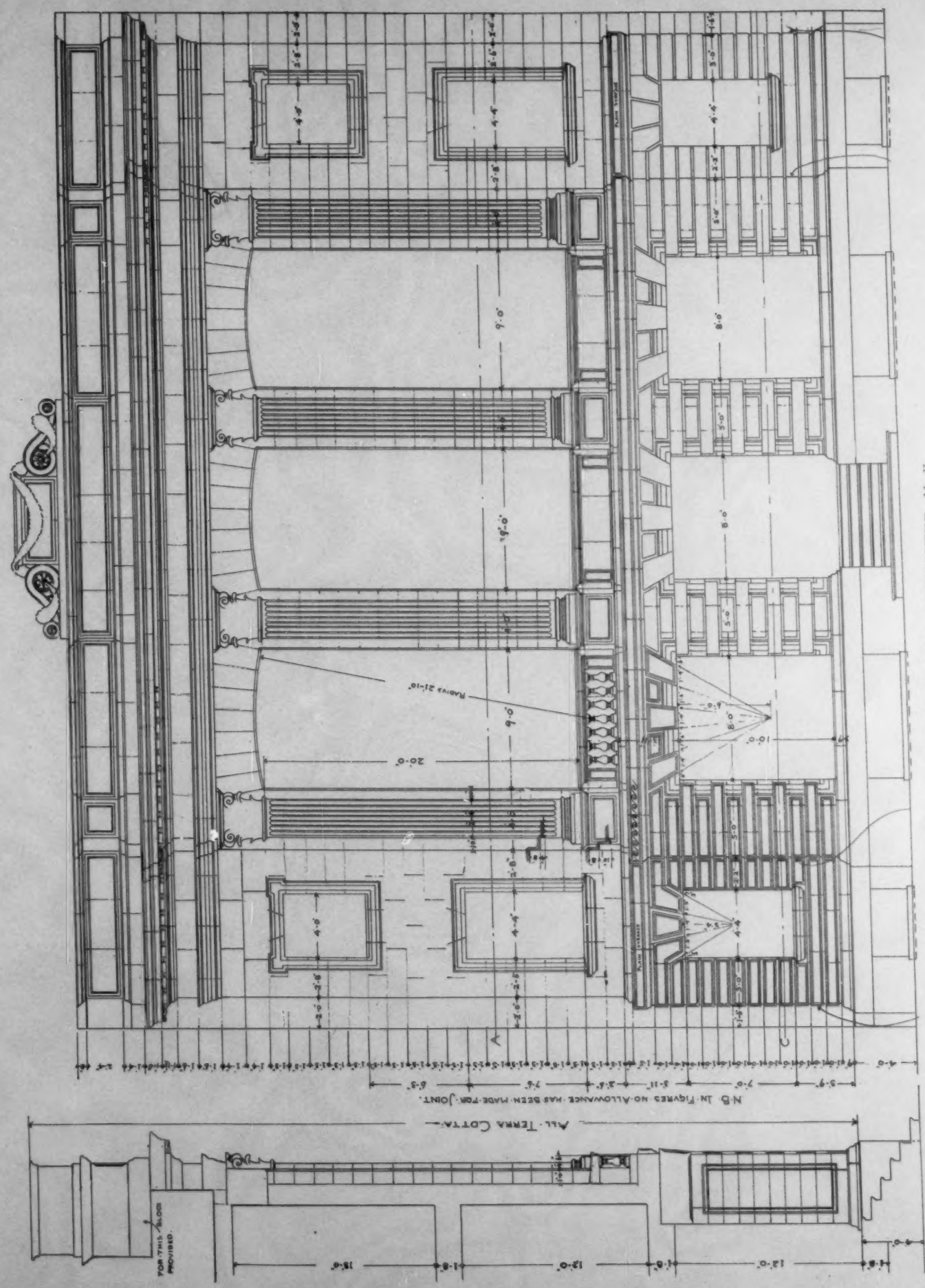

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